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United States Department of Agriculture,

DIVISION OF PUBLICATIONS—CIRCULAR I.

[Revised July 1, 1910.]

ORGANIZATION OF DEPARTMENT OF AGRICULTURE, 1910.

The following statement has been brought up to July 1, 1910. It shows the organization of the several branches of the Department as furnished by the Chiefs of Bureaus, Divisions, and Offices.

JOS. A. ARNOLD,
Editor and Chief.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., July 1, 1910.

OFFICE OF THE SECRETARY.

Secretary of Agriculture, JAMES WILSON.

The Secretary exercises personal supervision of public business relating to the agricultural industry. He appoints all the officers and employees of the Department with the exception of the Assistant Secretary and the Chief of the Weather Bureau, who are appointed by the President, and directs the management of all the Bureaus, Divisions, Offices, and the Forest Service, embraced in the Department. He exercises advisory supervision over agricultural experiment stations which receive aid from the National Treasury; has control of the quarantine stations for imported cattle, of interstate quarantine rendered necessary by sheep and cattle diseases, and of the inspection of cattle-carrying vessels; and directs the enforcement of the meat inspection and food and drugs laws under which the inspection of domestic and imported food products is carried on. He is charged with the duty of issuing rules and regulations for the protection, maintenance, and care of the national forest reserves. He is also charged with carrying into effect the laws prohibiting the transportation by interstate commerce of game killed in violation of local laws, and excluding from importation certain noxious animals, and has authority to control the importation of other animals.

The law establishing the Department, approved May 15, 1862, outlines the most important features of the work in the following provisions:

* * * the general design and duties of which [the Department of Agriculture] shall be to acquire and to diffuse among the people of the United

States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants. * * * *

* * * to acquire and preserve in his Department all information concerning agriculture which he can obtain by means of books and correspondence and by practical and scientific experiments (accurate records of which experiments shall be kept in his office), by the collection of statistics, and by any other appropriate means within his power; to collect, as he may be able, new and valuable seeds and plants; to test by cultivation the value of such of them as may require such tests; to propagate such as may be worthy of propagation, and to distribute them among agriculturists. He shall annually make a general report in writing of his acts to the President and to Congress, in which he may recommend the publication of papers forming parts of or accompanying his report, which report shall also contain an account of all moneys received and expended by him. He shall also make special reports on particular subjects whenever required to do so by the President or either House of Congress, or when he shall think the subject in his charge requires it.

Assistant Secretary of Agriculture, WILLET M. HAYS.

The Assistant Secretary of Agriculture performs such duties as may be required by law or prescribed by the Secretary. He also becomes the Acting Secretary of Agriculture in the absence of the Secretary.

Chief Clerk, S. R. BURCH.

The Chief Clerk has the general supervision of the clerks and employees; of the order of business, and of the records and correspondence of the Secretary's office; of all expenditures from appropriations for contingent expenses, stationery, etc.: he is responsible for the enforcement of the general regulations of the Department and is custodian of the buildings occupied by the Department of Agriculture.

Appointment Clerk, JOSEPH B. BENNETT.

The Appointment Clerk is charged by the Secretary with the decision of all questions affecting appointments, transfers, promotions, reductions, details, furloughs, and removals in their relation to the Civil Service law and regulations, and with the preparation of all papers necessitated thereby; and he deals with all questions affecting positions in the classified service. He has charge of all correspondence of the Department with the United States Civil Service Commission, and of all certificates and communications issued by that Commission to the Department. He supervises the preparation of all documents to be submitted to the Secretary of Agriculture for his signature in making appointments, transfers, promotions, reductions, furloughs, and removals in the Department of Agriculture. He is the recorder and custodian of the oaths of office and personal reports of all persons appointed in the Department, and of all reports of the several Chiefs of Bureaus, Divisions, and Offices respecting the efficiency of the several clerks and employees under their respective supervision in the Department. He has the custody and use of the Department seal.

Chief of Supply Division, CYRUS B. LOWER.

It is the duty of the Chief of the Supply Division to make all purchases of stationery and miscellaneous supplies, and to issue the

same on requisitions to the various Bureaus and Divisions of the Department; to receive and send out all express and freight shipments; and to receive and dispose of, by sale or otherwise, all property turned in by the various Bureaus and Offices when it is of no further use to them.

OFFICE OF THE SOLICITOR.

GEORGE P. McCABE, *Solicitor.*

The Solicitor is charged by law (Act of Congress approved May 26, 1910) with "the supervision and direction of the legal work of the Department of Agriculture." In accordance therewith, the Solicitor acts as legal adviser to the Secretary and has charge of the preparation of all legal papers to which the Department is a party, and of all communications to the Department of Justice and to the various officers thereof, including United States Attorneys; he represents the Department in all legal proceedings arising under the various statutes entrusted to the Department for execution. The legal work of all bureaus, offices, and divisions of the department, including all matters on which legal advice is necessary, is referred to him. All alleged violations of the Acts for the Protection of the National Forests, the Food and Drugs Act, the Animal Quarantine Laws, the Meat-Inspection Law, the Twenty-eight Hour Law, and other statutes entrusted to this Department for execution, are referred to the Solicitor to determine the action to be taken thereon by the Department. The Solicitor examines and approves, in advance of issue, all orders and regulations promulgated by the Secretary under statutory authority; he prosecutes applications of employees of the Department for patents to be dedicated to the public, and prepares all compilations of laws in which the Department is interested. He is a member of the Board of Food and Drug Inspection.

GENERAL OFFICE ADMINISTRATION. ENFORCEMENT OF THE TWENTY-EGHT HOUR LAW; BRIEFS, MEMORANDA, AND MISCELLANEOUS CORRESPONDENCE.

H. J. FEGAN, *Assistant to the Solicitor, in Charge.*

This section is charged with the supervision of all matters in connection with the Twenty-eight Hour Law (Act of June 29, 1906), including the preparation of cases arising under the Act and correspondence with the Attorney-General and United States Attorneys relative thereto. The general administrative conduct of the office, briefs and miscellaneous correspondence, are also handled by this section. In the absence of the Solicitor on official business the assistant in charge of this section acts for the Solicitor, and is in general charge of the office.

LAW WORK OF THE FOREST SERVICE.

R. W. WILLIAMS, JR., *Assistant to the Solicitor, in Charge.*

This section handles all the legal work of the Forest Service embraced in five clearly defined divisions, as follows:

1. *Claims.*—Comprising the litigation incident to contests in the General Land Office and before the Secretary of the Interior arising out of claims to lands in the National Forests under homestead, mineral, and other laws.

2. *Trespasses.*—Comprising the examination of reports and recommendations of the officers of the Forest Service in trespass cases on the National Forests, for the purpose of determining action to be taken by the Secretary; preparation of cases for submission to the Attorney-General; and supervision of letters prepared by the District Law Officers reporting to the Attorney-General timber, fire, fencing, and other trespasses on the National Forests.

3. *Opinions.*—Comprising the preparation of opinions to the Forester on all legal questions arising in the administration of the Washington Office of the Forest Service.

4. *Review of opinions of the District Law Officers.*—Comprising review for approval, modification, disapproval, and final draft where necessary, of formal written opinions of the District Law Officers to the District Foresters.

5. *Miscellaneous*.—Comprising, in part, draft of contracts, bonds, stipulations, and forms required in the administration of the National Forests; reports to the Secretary on proposed action by him in reference to use and occupation of the National Forests; preparation of letters requesting opinions of the Attorney-General and Comptroller of the Treasury on questions arising in the administration of the National Forests; supervision of correspondence with the Attorney-General in all matters relating to the administration of the National Forests; and replies to inquiries addressed to the Department relative to legal questions touching the National Forests.

ENFORCEMENT OF THE FOOD AND DRUGS ACT.

W. P. JONES, *Assistant to the Solicitor, in Charge*.

This section of the Office has charge of all work in connection with the enforcement of the Food and Drugs Act (Act of June 30, 1906), including the preparation of cases arising under Section 2 of the Statute, for submission to the Attorney-General, the handling of seizures under Section 10, and the issuance of citations and preparation of notices of judgment under Section 4 of the same Act.

CONTRACT WORK; ENFORCEMENT OF THE MEAT INSPECTION LAW; PATENTS.

C. W. BOYLE, *Assistant to the Solicitor, in Charge*.

This section of the Office is charged with the drawing of all agreements and leases to which this Department is a party and with renewals of the same; in addition, all cases arising under the Meat Inspection Law are prepared by the Assistant in Charge for submission to the Attorney-General, including correspondence with the Attorney-General and with United States Attorneys regarding the same.

This section also has charge of all work in connection with the prosecution of applications of employees of the Department for patents, to be dedicated to the public.

ENFORCEMENT OF THE ANIMAL QUARANTINE ACTS.

O. H. GATES, *Assistant to the Solicitor, in Charge*.

This section has charge of all cases arising under the Acts of May 29, 1884, February 2, 1903, and March 3, 1905, relative to the importation, exportation, and interstate transportation of diseased live stock, for transmission to the Attorney-General, including correspondence with the Attorney-General and United States Attorneys regarding the same, together with the supervision of all orders issued by the Secretary from time to time defining or referring to quarantine for diseases of live stock.

FILE ROOM.

L. H. GREEN, *in Charge*.

This section has charge of the files of this Office and also receives, sends out, and handles the mail.

STENOGRAPHIC SECTION.

HARRY GODING, *in Charge*.

This section is charged with the stenographic and typewriting work of the Office.

LAW OFFICERS AND ASSISTANT LAW OFFICERS STATIONED IN THE FIELD.

W. M. AIKEN, G. E. TROWBRIDGE, BLAKE FRANKLIN, W. C. HENDERSON, W. F. STALEY, H. P. DECHANT, *Law Officers*. H. H. CLARKE, J. F. LAWSON, R. F. FEAGANS, A. W. JENSEN, D. F. MCGOWAN, *Assistant Law Officers*.

Branches of the Office of the Solicitor are located at Missoula, Montana; Portland, Oregon; Ogden, Utah; San Francisco, California; Denver, Colorado; and Albuquerque, New Mexico. There is one Law Officer and one Assistant Law

Officer stationed at each office, with the exception of San Francisco, where there is no Assistant Law Officer at present.

These offices were established, in the beginning, for the handling of legal work of the Forest Service in the field. The Law Officers and their Assistants are the legal advisers of the District Foresters; in addition they now handle such local legal work of the Department of Agriculture as may be assigned by the Solicitor.

THE WEATHER BUREAU.

Chief, WILLIS L. MOORE; Assistant Chief, HENRY E. WILLIAMS; Chief Clerk, DANIEL J. CARROLL.

The Chief of the Weather Bureau has charge of the forecasting of the weather; the issue and display of weather forecasts, and storm, cold wave, frost, and flood warnings for the benefit of agriculture, commerce, and navigation; the gaging and reporting of river stages; the maintenance and operation of the U. S. Weather Bureau telegraph and telephone lines; the collection and transmission of marine intelligence for the benefit of commerce and navigation; the reporting of temperature and rainfall conditions for the corn, wheat, cotton, sugar, rice, and other interests; the distribution of meteorological information in the interests of agriculture and commerce, and the taking of such meteorological observations as may be necessary to establish and record the climatic conditions of the United States, or as are essential for the proper execution of the foregoing duties. In the absence of the Secretary of Agriculture and the Assistant Secretary he becomes Acting Secretary of Agriculture.

For the purpose of making its daily atmospheric survey, the Weather Bureau maintains a Central Office in Washington and about 200 subordinate stations in various portions of the United States, including Alaska and Hawaii, and throughout the West Indies. In addition to these it receives, through the courtesy of the Governments concerned, daily telegraphic reports of observations made in Canada on the north, Mexico on the south, in the Azores and Iceland, along the western coast of Europe, and in European and Asiatic Russia, thus covering within its field of observation practically the whole of the inhabited portions of the North American continent, and the North Atlantic Ocean, western and northern Europe, and northern Asia.

The Assistant Chief, under the direction of the Chief of Bureau, has the supervision of matters pertaining to the personnel of stations, such as appointments, promotions, details, and assignments, the instruction in station duties of newly appointed Assistant Observers assigned to the Central Office for that purpose, and of such other matters as are not specifically assigned to the various divisions. In the absence of the Chief of Bureau he performs the duties of that official.

In addition to the duties imposed by the statutes on all bureau chief clerks, the Chief Clerk of the Weather Bureau performs the duties of the Assistant Chief in the absence of that official, and in the absence of both the Chief and Assistant Chief he assumes charge of the Bureau. He controls all disbursements payable from the contingent fund and is charged with the care and preservation of the Weather Bureau buildings and grounds in Washington, D. C. He has supervision of the heat, light, and power plants, electrical work, the carpenter shop, the drafting room, and the U. S. Capitol weather-map stations. He has direct charge of all mechanics and other employees not assigned to divisions, including the supervision of the watch force and the general messenger and labor service. He inspects and passes upon all requests for printing and binding, and is the custodian of all administrative papers and of papers and records relating to the personnel of the Bureau.

THE FORECAST DIVISION.

[In Charge of Forecaster on Duty.]

This Division receives and charts twice daily, telegraphic reports of the prevailing weather conditions throughout the field of observation. From the ob-

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servations thus charted the forecast official issues a statement of impending weather changes in all parts of the country, including the Great Lakes, the sea-coasts, and the North Atlantic steamer route as far eastward as the Grand Banks. In the case of severe disturbances warnings are issued, not only to the regular Weather Bureau stations along the Lakes and seacoast, but also to about 320 special storm-warning stations at the lesser ports and at exposed points visible from the fairway of vessels. The forecast official also issues warning of approaching cold waves and heavy snows in the winter season and of frost in the spring and fall months, special attention being given to the needs of truck farmers in the Gulf and South Atlantic States, the cranberry growers of Wisconsin, New Jersey, and Massachusetts, and the fruit growers of Florida and California. This Division conducts special studies that apply to the problem of weather forecasting.

THE RIVER AND FLOOD DIVISION.

HARRY C. FRANKENFIELD, *in Charge*.

As its name implies, the River and Flood Division is concerned with the rivers of the United States. In times of average or low-water stages its business is to facilitate commerce by giving information as to future stages of water along the navigable rivers; its chief function, however, is the issuance of flood warnings in times of threatened danger to life and property along the rivers, whether navigable or otherwise. There are 370 special river stations along the rivers of the country, in addition to 61 regular Weather Bureau stations where river observations are taken. There are also 107 special rainfall stations maintained in the various watersheds.

THE CLIMATOLOGICAL DIVISION.

FRANK H. BIGELOW, *in Charge*.

This Division has supervision over more than 3,500 cooperative stations, from which are collected daily observations of temperature, precipitation, and other meteorological conditions necessary to establish a history of the climate of the various portions of the United States, and over the publication of the data in monthly and annual summaries.

The records from the cooperative stations and the full meteorological reports from the regular stations of the Bureau are permanently filed in this Division, which prepares from these the tabular climatic data for the Annual Report of the Chief of Bureau, the principal tables and charts of the Monthly Weather Review, and such papers on the climatology of the various portions of the country as are necessary to meet the public needs. It also furnishes certified copies of weather records for use in courts, and general meteorological and climatological data required by individuals for business, health, or other reasons.

This Division has charge of the collection of weather information from numerous correspondents during the seasons of planting, growth, and harvest, and of the dissemination of the same by the issuance of bulletins, or otherwise. Special attention is given to the corn, wheat, cotton, sugar, and rice interests, daily bulletins of weather conditions being issued during the season in the districts where these crops are largely grown. It also collects and publishes weekly during the winter months data showing the depth of snow on the ground and the thickness of ice in rivers and harbors.

This Division also has charge of the gathering of information as to the depth of snowfall in the mountains of the West, for a study of the flow of water in the streams supplying the great irrigation projects in those regions; of the study of the rate of evaporation from ponds and lakes, in the interest of water storage for irrigation, power development, or navigation; of the barometry of the United States, and the preparation of the normals of pressure, temperature, vapor pressure, precipitation, etc.; and of the interbureau cooperation between the Weather Bureau, Reclamation Service, Water Resources Branch of the Geological Survey, Forest Service, and the Bureau of Plant Industry, in the study of problems of mutual interest.

This Division also has supervision of special meteorological stations established for the purpose of securing telegraphic reports for use in making daily forecasts.

The professor in charge of the Climatological Division is the editor of the *Monthly Weather Review*, which contains text, charts, and statistical tables illustrating the dominant weather conditions of each month, a brief statement of the forecasts of storms and floods, a climatological summary, special contributions relative to meteorology, and a list of recent papers bearing on the work of the Bureau, or added to its library.

THE DISTRIBUTING DIVISION.

JAMES BERRY, *Chief*.

This Division has charge of the general distribution of the weather forecasts and the special warnings of cold waves, frosts, and severe local storms, by telegraph at Government expense, and of the gratuitous dissemination of all such information by telephone, telegraph, railway train and telegraph service, regular mail service, and rural delivery. It has supervision of the storm-warning display stations on the Great Lakes and the Atlantic, Pacific, and Gulf coasts, the stations displaying flags representing the daily weather forecasts, and a number of special meteorological stations in the United States.

The work of examining the various meteorological reports, daily, monthly, and annual, excepting those pertaining wholly to marine work, is performed in this Division.

THE INSTRUMENT DIVISION.

CHARLES F. MARVIN, *in Charge*.

The Instrument Division is charged with the equipment of stations with the instruments required and used in the making of meteorological observations.

The instruments are purchased under detailed specifications emanating from the division, and before issue to stations are thoroughly tested and adjusted so that their errors become known and their indications are made certain and reliable.

All station officials are directed and instructed in detail in regard to the exposure and installation of instruments, in order to take due account of local conditions.

The record sheets, from the automatic instruments especially, as made at stations, are critically inspected to ascertain not only whether the instruments are rendering proper service, but as well to determine whether the observers fully understand and care for their maintenance and proper operation.

The division is also charged with the engineering details in connection with the equipment of storm-warning stations with steel towers for the display of flags and electric and oil-burning lanterns, and with the maintenance of the seismographs installed at the central office in Washington, and the reduction of records obtained therefrom.

THE MARINE DIVISION.

HENRY L. HEISKELL, *Chief*.

This Division collates from the reports of vessels of war or commerce, or other sailing craft, all meteorological and physical information pertaining to the oceans; plots the data (pressure, temperature, wind, and weather) on daily synoptic charts for study and for the preparation of monthly summary charts for use in tracing the atmospheric conditions from continent to continent; collects and compiles in tabular form the meteorological data just mentioned for use in the preparation of the monthly meteorological charts of the Atlantic and Pacific oceans issued by the Weather Bureau, and also of the monthly pilot charts of the same oceans, published by the Hydrographic Office, Navy Department. The normal pressure and temperature, wind roses showing the

direction and force of the prevailing winds for all coast stations and each 5° square of latitude and longitude, and the percentage of fogs and gales are portrayed on these charts. This work necessitates the collection of reports from 2,100 cooperating marine observers, embracing a large percentage of the merchant and naval service of every seafaring nationality; checking and acknowledging the receipt of about 11,000 reports and the distribution of the forms for recording the data; and the supervision of 23 distributing centers on the Atlantic, Gulf, and Pacific coasts, and at San Juan, Porto Rico, and Honolulu, Hawaii.

The Division is charged with the supervision of the wireless telegraphic weather service of the Atlantic and Pacific coasts, the inauguration of which service on the Pacific coast, and the utilization of the weather reports from United States transports en route from San Francisco to the Philippines by the Weather Bureau official at San Francisco and from vessels in the Alaskan trade by the official at Portland, Oreg., may prove of great value in forecasting the weather conditions of that section. It also supervises the marine reporting service at the telegraphic coast stations on the Atlantic and Pacific coasts, including the reporting at the recipient's expense, to all parties requesting it, information of all passing vessels, and of wrecks, marine disasters, and other casualties, and the transmission of all communications between masters, owners, underwriters, and others concerned. During the past fiscal year these stations reported the passing of 25,220 vessels.

THE TELEGRAPH DIVISION.

JESSE H. ROBINSON, *Chief*.

The Telegraph Division is charged with the receipt and transmission of all telegrams, the arrangement and control of telegraph circuits, the maintenance and repair of United States Weather Bureau telegraph and telephone lines and submarine cables, and the examination of all telegraph accounts.

THE LIBRARY.

CHARLES F. TALMAN, *Librarian, in Charge*.

The library of the Weather Bureau contains about 28,000 books and pamphlets. It includes standard works of reference and technical books on meteorology and allied sciences for the use of Weather Bureau officials in Washington and elsewhere, and a very complete file of the publications of meteorological and climatological services in all parts of the world. Especial attention is paid to the collection and classification of climatological data from distant regions, constant demands for which are received from officials in the different bureaus of the Department as well as from the public through correspondence.

A catalogue is prepared of the meteorological contents of all the principal scientific periodicals of the world, including proceedings and transactions of societies. Lists of recent books and papers bearing on meteorology are compiled for publication in the Monthly Weather Review, and similar lists are prepared weekly, in manuscript, for the information of the employees at the central office. Abstracts of recent literature and notes on the progress of meteorology at home and abroad are also contributed to the Review.

The Librarian also has supervision over the collection of text and reference books allowed each local office of the Weather Bureau, and has charge of the examinations for promotion in the Weather Bureau.

THE PUBLICATIONS DIVISION.

JOHN P. CHURCH, *Chief*.

This Division is charged with the printing and mailing of the daily map, the Monthly Weather Review, the Mount Weather Bulletin, and the various charts and miscellaneous printed matter pertaining to the Weather Bureau.

THE DIVISION OF SUPPLIES.

ROBERT SEYBOTH, *Chief*.

This Division is charged with the purchase and issue of supplies and the safe-keeping of all public property belonging to the Weather Bureau.

ACCOUNTS.

[Division of Accounts and Disbursements, Weather Bureau Branch.]

EDGAR B. CALVERT, *in Charge*.

The Division of Accounts audits, adjusts, and prepares for payment all accounts and claims against the Weather Bureau; prepares advertisements; issues requests for passenger transportation; prepares the annual estimates of appropriations; transacts all business relating to the financial interests of the Weather Bureau; and supervises the construction of Weather Bureau Buildings outside of Washington, including repairs thereto.

MOUNT WEATHER METEOROLOGICAL RESEARCH OBSERVATORY.

(Mount Weather, Va.)

ALFRED J. HENRY, *in Charge*.

The purpose of this observatory is to carry on an extensive system of observations and experiments along the line of meteorological research. The work will include the exploration of the atmosphere to altitudes of 3 to 10 miles by means of kites and balloons; research in the allied subjects of solar radiation, atmospheric electricity, the ionization of gases, radio-activity, etc.; the discussion of meteorological observations from the point of view of their relation to solar physics, and the selection of meteorological and magnetic elements and their comparisons with solar observations. At this institution the Weather Bureau will have the most approved apparatus for measuring atmospheric electricity, magnetism, and solar radiation. The results of these observations and experiments will be described in the Bulletin of the Mount Weather Observatory, a publication devoted to a consideration of the more advanced problems of meteorology.

WEATHER BUREAU STATIONS AND WORK OUTSIDE OF WASHINGTON, D. C.

In the performance of the duties imposed upon it by the organic act the Weather Bureau maintains throughout the United States, in the West Indies, and in Hawaii 200 meteorological stations, employing from one to ten men each. At these stations regular meteorological observations are taken and telegraphed, meteorological data recorded and tabulated, and the forms and publications necessary to the effective distribution of the forecasts, warnings, and climatological data prepared and issued.

For forecast purposes the United States is divided into districts comprising: (1) The Upper Mississippi Valley and the Northwest, Henry J. Cox, Chicago, Ill., in charge. (2) Louisiana, Texas, Arkansas, and Oklahoma, Isaac M. Cline, New Orleans, La., in charge. (3) Utah, Colorado, New Mexico, and Arizona, Frederick H. Brandenburg, Denver, Colo., in charge. (4) California and Nevada, Alexander G. McAulie, San Francisco, Cal., in charge. (5) Washington, Oregon, and Idaho, Edward A. Beals, Portland, Oreg., in charge. (6) The remainder of the United States, Forecaster on duty, Washington, D. C., in charge. At the first three of the stations named morning forecasts only are prepared and distributed; at the last three, both morning and evening forecasts.

For purposes of inspection the United States is divided into two inspection districts, designated, respectively, the Eastern District, which includes the region to the east of the Mississippi River and all Weather Bureau stations on that river, and the Western District, comprising the remainder of the United States. The inspectors of the Weather Bureau are Norman B. Conger and Henry B. Hersey, with headquarters at Detroit, Mich., and Milwaukee, Wis., respectively.

For the collection and distribution of climatological data and information relating to current weather conditions, the United States, including Porto Rico and Hawaii, is divided into 44 local sections, which, with the names of the officials in charge and the section centers, are as follows:

Alabama, Patrick H. Smyth, Montgomery.	Nevada, Henry F. Alps, Reno.
Arizona, Lewis N. Jesunofsky, Phoenix.	New England, John W. Smith, Boston, Mass.
Arkansas, Henry F. Alciatore, Little Rock.	New Jersey, Levi A. Judkins, Atlantic City.
California, Alexander G. McAdie, San Francisco.	New Mexico, Charles E. Linney, Santa Fe.
Colorado, Frederick H. Brandenburg, Denver.	New York, Wilford M. Wilson, Ithaca.
Florida, Alexander J. Mitchell, Jacksonville.	North Carolina, Lee A. Denson, Raleigh.
Georgia, Charles F. von Herrmann, Atlanta.	North Dakota, Orris W. Roberts, Bismarck.
Hawaii, William B. Stockman, Honolulu.	Ohio, J. Warren Smith, Columbus.
Idaho, Edward L. Wells, Boise.	Oklahoma, J. Pemberton Slaughter, Oklahoma.
Illinois, William G. Burns, Springfield.	Oregon, Edward A. Beals, Portland.
Indiana, Verne H. Church, Indianapolis.	Pennsylvania, George S. Bliss, Philadelphia.
Iowa, George M. Chappel, Des Moines.	Porto Rico, Oliver L. Fassig, San Juan.
Kansas, Thorp B. Jennings, Topeka.	South Carolina, Jacob W. Bauer, Columbia.
Kentucky, Ferdinand J. Walz, Louisville.	South Dakota, Samuel W. Glenn, Huron.
Louisiana, Isaac M. Cline, New Orleans.	Tennessee, Roscoe Nunn, Nashville.
Maryland and Delaware, William H. Alexander, Baltimore, Md.	Texas, Bernard Bunnemeyer, Houston.
Michigan, Charles F. Schneider, Grand Rapids.	Utah, Alfred H. Thiessen, Salt Lake City.
Minnesota, Ulysses G. Purssell, Minneapolis.	Virginia, Edward A. Evans, Richmond.
Mississippi, James H. Scott, Vicksburg.	Washington, George N. Salisbury, Seattle.
Missouri, George Reeder, Columbia.	West Virginia, Henry C. Howe, Parkersburg.
Montana, R. Frank Young, Helena.	Wisconsin, Henry B. Hersey, Milwaukee.
Nebraska, George A. Loveland, Lincoln.	Wyoming, Walter S. Palmer, Cheyenne.

In order to present to the public in the most practical form the results of the climatological observations, the United States has been divided into twelve climatological districts, in accordance with the great natural drainage areas, and twelve district editors have been appointed over these districts who shall severally receive the observed data from the section directors and assist in editing the same for the Monthly Weather Review. These district editors are as follows:

- Wilford M. Wilson, district No. 1, Ithaca, N. Y.
- Charles F. von Herrmann, district No. 2, Atlanta, Ga.
- Ferdinand J. Waltz, district No. 3, Louisville, Ky.
- Prof. Henry J. Cox, district No. 4, Chicago, Ill.
- George M. Chappel, district No. 5, Des Moines, Iowa.
- Montrose W. Hayes, district No. 6, St. Louis, Mo.
- Isaac M. Cline, district No. 7, New Orleans, La.
- Bernard Bunnemeyer, district No. 8, Houston, Tex.
- Frederick H. Brandenburg, district No. 9, Denver, Colo.
- Alfred H. Thiessen, district No. 10, Salt Lake City, Utah.
- Prof. Alexander G. McAdie, district No. 11, San Francisco, Cal.
- Edward A. Beals, district No. 12, Portland, Oreg.

The purpose is to make the Monthly Weather Review a journal of practical meteorology in regard to current problems of agriculture, transportation, water resources, forestry, etc.

BUREAU OF ANIMAL INDUSTRY.

Chief, A. D. MELVIN; *Assistant Chief*, A. M. FARRINGTON; *Chief Clerk*,
CHARLES C. CARROLL.

The Bureau of Animal Industry has charge of the work of the Department relating to the live-stock industry. In general it deals with the investigation, control, and eradication of diseases of animals, the inspection and quarantine of live stock, the inspection of meat and meat food products, and with animal husbandry and dairying.

The Bureau conducts the inspection of live stock, meats, and meat food products intended for interstate or foreign commerce, under the act of Congress of June 30, 1906, and also has charge of the inspection of import and export animals, the inspection of ships for the transportation of export animals, and the quarantine stations for imported animals. It investigates the existence of communicable diseases of live stock, makes original scientific investigations as to the nature, cause, and prevention of such diseases, and takes measures for their repression and eradication, frequently in cooperation with State and Territorial authorities. As part of this work, a quarantine of the section infected with Texas or southern fever of cattle is maintained, the extermination of the tick which transmits this disease has been undertaken, and sheep scab and cattle mange are being eradicated from the West. The Bureau makes investigations in the breeding and feeding of animals and in regard to dairy subjects, and supervises the manufacture of and interstate commerce in renovated butter. Reports of scientific investigations and treatises on various subjects relating to the live-stock industry are prepared and published.

THE ANIMAL HUSBANDRY DIVISION.

GEORGE M. ROMMEL, *Chief*.

This Division gathers information and makes studies and experiments concerning the breeding and feeding of farm animals and poultry; supervises pedigree record associations under paragraph 492 of the tariff act of August 5, 1909, and attends to correspondence and prepares publications on these subjects. The office is now engaged in experiments in regard to the harmful properties of cotton seed and cotton-seed products when fed to hogs; experiments in breeding small animals; the study of cross breeding in sheep; the utilization of native goats for milk production; hybridizing the Grévy zebra with asses and horses; experiments to test the value of different systems of feeding poultry; a study of the cost of production of poultry and eggs, and a study of market and transportation problems connected with the egg and poultry trade. Cooperative work with State agricultural experiment stations comprises investigations in animal nutrition at the Pennsylvania Station, in beef production at the Alabama Station, in horse breeding in Colorado, Iowa, and Vermont, in breeding milking Shorthorn cattle in Minnesota, in breeding Holstein-Friesian cattle in North Dakota, in poultry breeding and management in Maine, and in sheep breeding in Wyoming. The staff of this office includes G. Arthur Bell, assistant animal husbandman, in charge of beef cattle and hog investigations; E. L. Shaw, assistant in animal husbandry, in charge of sheep and goat investigations; Rob R. Slocum, poultry assistant, in charge of poultry investigations; Roy A. Cave, herd-book assistant; E. H. Riley, scientific assistant in animal breeding investigations; W. F. Hammond, superintendent of Morgan horse farm; John O. Williams, scientific assistant in charge of Colorado horse breeding station; Alfred R. Lee, junior animal husbandman in poultry investigations, and W. F. Ward, scientific assistant in southern beef production investigations.

THE BIOCHEMICAL DIVISION.

M. DORSET, *Chief*.

This Division prepares tuberculin and mallein and furnishes these substances free of charge to health officers for use in official tests. It conducts experiments concerning immunity, with the object of obtaining vaccines and antitoxins for animal diseases; carries on researches concerning the causes of certain infectious diseases; in connection with the meat-inspection service makes

bacteriological and chemical examinations of meats and meat food products and of condiments, etc., used in their preparation; carries on experiments with dips and disinfectants; prepares records of tests and experiments; and prepares for publication from time to time reports of work which has been completed.

The scientific staff of the Division includes T. M. Price, in charge of central meat-inspection laboratory; C. N. McBryde, in charge of bacteriological investigations of meats; W. B. Niles, inspector in charge of field experiments concerning hog cholera; R. M. Chapin, in charge of investigations of stock dips; A. E. Graham, C. H. Swanger, A. H. Roop, W. B. Smith, and E. A. Boyer, chief laboratory inspectors in branch meat-inspection laboratories.

THE DAIRY DIVISION.

B. H. RAWL, *Chief*.

The work of this Division is "to collect and disseminate information concerning dairy farming, the care and improvement of dairy cattle, and the production, care, and distribution of dairy products." It maintains a general survey of the condition of the dairy industry in the country at large and in the different sections, in addition to special inquiries as to dairy organizations, dairy schools and facilities for technical instruction, State dairy laws, the development of markets, the milk supply of cities and towns, and the laws and regulations in reference thereto.

Investigations are conducted in dairy farm management, including special work in the Southern States for the introduction of better dairy practice and the encouragement of diversified farming through the introduction of dairying. The formation of cow-test associations on a self-sustaining basis is receiving attention.

The Division also makes investigations as to the manufacture of butter and cheese, including European varieties of cheese, and concerning dairy machinery and equipment. The Division architect prepares plans and technical advice for the construction of sanitary and economical dairy buildings. The organization and management of creameries and factories and of the larger dairy enterprises, now increasing in number and importance, are receiving special attention. The Division is also charged with the details of administration of the laws concerning the inspection of factories and markets for "renovated" or "process" butter and of dairy products for export.

Considerable attention has been given to work in connection with the improvement of city milk supplies. This is accomplished by means of cooperation with the local authorities. Public meetings are arranged wherein the producers, consumers, physicians, and others are brought together and the subject of milk improvement discussed. There is usually also a competitive exhibit of milk and cream, and sometimes of dairy farms. The score-card system of scoring dairies and farms used and recommended by the Division is indispensable for this work. It has been found of great value in a large number of cities where it is now regularly in use.

Reports upon these lines of work are prepared and published, and an extensive correspondence is conducted to ascertain and meet the needs of those interested in the various departments of the dairy industry. The Division seeks to serve as a clearing house for dairy experience and information. Its officers and agents visit the dairy centers and conventions for personal contact and advice.

The work of the Dairy Division is subdivided as follows: Dairy farming investigations, in charge of Helmer Rabild; dairy products investigations, in charge of L. A. Rogers; dairy manufacturing investigations, in charge of B. D. White; market milk investigations, in charge of George M. Whitaker; renovated butter inspection, in charge of M. W. Lang.

THE INSPECTION DIVISION.

RICE P. STEDDOM, *Chief*; MORRIS WOODEN, R. A. RAMSAY, and ALBERT E. BEHNKE, *Associate Chiefs*.

The work of the Inspection Division consists of two main lines—the meat inspection and the field work for the control and eradication of contagious diseases.

The meat inspection includes the ante-mortem and the post-mortem inspection of cattle, sheep, swine, and goats slaughtered at establishments engaged in interstate or foreign commerce; the supervision of such establishments and of the various processes of preparing, curing, canning, packing, etc., so as to insure sanitary conditions, equipment, and methods; the condemnation and proper disposal of carcasses and products found to be diseased, unwholesome, or otherwise unfit for human food; the marking and certification of meats and products that have been inspected and passed, and the regulation and supervision of the interstate transportation and exportation of meats and meat food products. The meat inspection is carried on at 844 establishments in 221 cities and towns.

The field work consists in the inspection of live stock at points of origin, in transit, and at market centers, the disinfection of cars, and the supervision and enforcement of other measures to prevent the spread of contagious diseases through the channels of interstate commerce and to stamp out such diseases. This includes the eradication of southern cattle ticks, the inspection of southern cattle, and the supervision of their movement when forwarded from the area quarantined on account of Texas or southern cattle fever, also the inspection and, when necessary, the dipping of sheep and cattle to eradicate and prevent the spread of scabies. As a result of the latter work, in cooperation with State and Territorial authorities, sheep scab and cattle mange have been wiped out from large areas in the West where they were formerly prevalent, and efforts are being directed toward the ultimate eradication of these diseases from the United States.

THE PATHOLOGICAL DIVISION.

JOHN R. MOHLER, *Chief*.

The work of this Division is chiefly along the lines of investigating diseases of animals. It prepares and distributes blackleg vaccine and tabulates the results for publication; conducts scientific investigations of animal diseases; carries on experiments with immunizing agents for the purpose of protecting animals against diseases; cooperates with the State agricultural experiment stations with a view to combating diseases peculiar to the localities; determines pathological specimens referred to the Division for diagnosis; and prepares answers to numerous inquiries regarding diseases of animals. Reports are prepared and published upon the experimental work carried on.

The scientific staff of the Division includes Henry J. Washburn, senior bacteriologist; J. S. Buckley, in charge of blackleg investigations; George Byron Morse, in charge of investigations concerning diseases of poultry and cold-blooded animals; George H. Hart, in charge of rabies and glanders investigations; Charles F. Flocken, in charge of cooperative experiments with the Minnesota Experiment Station; Adolph Eichhorn, in charge of field investigations; Robert J. Formad, assistant in animal pathology; Rosslyn J. Stafford, assistant in animal bacteriology; Jacob Traum, assistant in animal bacteriology; H. C. Campbell, in charge of cooperative experiments with Pennsylvania Live-stock Sanitary Board; H. J. Frederick, in charge of cooperative experiments with Utah Experiment Station; and L. Enos Day, in charge of branch pathological laboratory at Chicago, Ill.

THE QUARANTINE DIVISION.

RICHARD W. HICKMAN, *Chief*.

The inspection and quarantine of imported animals with a view to excluding contagion, the management of the animal quarantine stations, and the inspection of live stock for export, come under this Division. The ships carrying exported animals are also inspected, and regulations as to fittings, equipment, ventilation, feed, water, attendants, etc., are enforced. The Quarantine Division administers the sanitary regulations governing the importation of hides, hay, and straw, and directs the tuberculin testing of cattle and the mallein testing of horses for export and import. It also carries on cooperative work with State and other authorities for the tuberculin testing of cattle for interstate shipment and of cows supplying milk to cities, for the purpose of determining the prevalence and extent of tuberculosis among cattle throughout the United States and of eliminating the disease from dairy herds.

THE DIVISION OF ZOOLOGY.

B. H. RANSOM, *Chief*.

This Division collects and describes animal parasites of all kinds; determines such parasites as are sent to the Bureau, and conducts correspondence regarding them; keeps a card index of animal parasites and a bibliography of literature relating to them; investigates diseases of parasitic origin, and prepares and publishes reports on such investigations. Scientific assistants are Albert Halls, H. W. Graybill, Maurice C. Hall, S. H. Shawhan, and Howard Crawley.

THE EXPERIMENT STATION.

E. C. SCHROEDER, *Superintendent*; W. E. COTTON, *Assistant*.

The Experiment Station of the Bureau is located at Bethesda, Md. It is equipped for and conducts investigations regarding animal diseases with a view to their control and eradication and their bearing on the public health, and investigations in animal breeding with special reference to the laws of heredity, the production of useful hybrids, and the development of increased resistance to disease. A small farm is maintained in such a manner as to provide the other divisions of the Bureau with facilities for making observations for which large domestic animals are needed.

The work of the station consists of independent original investigations and investigations in cooperation with and supplemental to those of the other divisions. Reports of the results obtained are written for publication.

THE EDITORIAL OFFICE.

JAMES M. PICKENS, *Editor*.

The work of this office comprises the editing and proof reading of the publications of the Bureau, the indexing of such as require it, the compilation of the annual report, and the preparation of special articles and other material for publication. This office also makes translations, compiles information, and attends to correspondence relating to the Bureau's publications and miscellaneous subjects.

BUREAU OF PLANT INDUSTRY.

Physiologist and Pathologist, and Chief of Bureau, BEVERLY T. GALLOWAY; *Pomologist, and Assistant Chief of Bureau*, G. HAROLD POWELL; *Chief Clerk*, JAMES E. JONES; *Editor*, J. E. ROCKWELL; *Officer in Charge of Records*, W. P. COX.

The Bureau of Plant Industry studies plant life in all its relations to agriculture. The scientific work of the Bureau is divided into 32 distinct groups corresponding to the divisions of other Bureaus. A brief statement of the special work and organization of each group follows:

LABORATORY OF PLANT PATHOLOGY.

ERWIN F. SMITH, *Pathologist in Charge*.

This is the central working laboratory for all of the pathological investigations conducted by the Bureau. Studies of the diseases of a wide variety of crop plants are made in the laboratory and supplemented by field investigation and experimentation.

The scientific staff, under Doctor Smith's direction, includes R. E. B. McKenney, Expert; John R. Johnston, Assistant Pathologist; Aristide W. Giampietro, Assistant Physiologist; and Florence Hedges and Lucia McCulloch, Laboratory Assistants.

FRUIT DISEASE INVESTIGATIONS.

MERTON B. WAITE, *Pathologist in Charge.*

This work is devoted especially to the study of the diseases of fruits and of methods of controlling or preventing them. Field demonstrations are an important part of the work. The investigations cover both orchard fruits and the small fruits.

The scientific staff, under Mr. Waite's direction, includes C. L. Shear and W. M. Scott, Pathologists; W. S. Ballard, L. A. Hawkins, and George F. Miles, Assistants; P. J. O'Gara, Assistant Pathologist; F. V. Rand and J. W. Roberts, Assistants; J. M. Shull, Expert; and Clara H. Hasse, Laboratory Assistant.

INVESTIGATIONS IN FOREST PATHOLOGY.

HAVEN METCALF, *Pathologist in Charge.*

This work consists of the study of the various diseases affecting forest trees and woods, as well as ornamental and shade trees. All of the work is conducted in close cooperation with the Forest Service.

The scientific staff, under Doctor Metcalf's direction, includes George G. Hedcock and Perley Spaulding, Pathologists; and Carl P. Hartley and C. J. Humphrey, Assistants.

COTTON AND TRUCK DISEASES AND PLANT DISEASE SURVEY.

W. A. ORTON, *Pathologist in Charge.*

These investigations cover all diseases of garden vegetables, with special reference to the field demonstration of methods of control and prevention. Work on the diseases of cotton, cowpeas, and other crops, and the collection of data regarding the general prevalence of plant diseases in the United States are also a part of these investigations.

The scientific staff, under Mr. Orton's direction, includes J. B. Norton, Physiologist; W. W. Gilbert, Assistant Pathologist; L. L. Harter, Assistant Physiologist; and Ethel C. Field, Laboratory Assistant.

PATHOLOGICAL COLLECTIONS AND INSPECTION WORK.

FLORA W. PATTERSON, *Mycologist in Charge.*

This office is charged with the maintenance of economic collections of pathological and related material for use by the investigators of the Bureau, and also with the inspection of plants received by the Bureau, to guard against the introduction of disease. Assisting in the work is Vera K. Charles, Laboratory Assistant.

SOIL BACTERIOLOGY AND WATER PURIFICATION INVESTIGATIONS.

KARL F. KELLERMAN, *Physiologist in Charge.*

This work has reference to the study of the relation of bacteria to soil fertility, plant growth, and the fixation of nitrogen. The distribution of pure cultures of nodule-forming bacteria for leguminous crops is a feature of the work. The organisms contaminating farm water supplies are also being studied, with a view to their eradication.

The scientific staff, under Mr. Kellerman's direction, includes Ira G. McBeth, Assistant Physiologist; E. R. Allen and R. C. Wright, Assistants; and F. L. Goll and Edna H. Fawcett, Laboratory Assistants.

CROP PHYSIOLOGY AND BREEDING INVESTIGATIONS.

WALTER T. SWINGLE, *Physiologist in Charge.*

This work is concerned with the study of the cultural requirements of various crop plants, especially of fruit and nut crops for cultivation in the Southwest and in other parts of the country. Agricultural demonstrations among the Indians are also a feature of these investigations.

The scientific staff, under Mr. Swingle's direction, includes S. C. Mason, Arboriculturist; G. P. Rixford, Expert; and W. L. Flanery, E. M. Savage, Bruce Drummond, and E. W. Hudson, Assistants.

ACCLIMATIZATION AND ADAPTATION OF CROP PLANTS.

O. F. Cook, *Bionomist in Charge*.

These investigations have special reference to the acclimatization in the South and Southwest of Central American varieties of cotton, corn, and other crops originating in tropical countries, especially fruits and vegetables. The breeding of cottons for the boll-weevil territory is also a feature of the work.

The scientific staff, under Mr. Cook's direction, includes G. N. Collins and F. L. Lewton, Assistant Botanists; H. Pittier, Special Field Agent; S. M. Bain Expert; E. B. Boykin, J. H. Kinsler, Argyle McLachlan, and D. A. Saunders, Special Agents; and E. C. Ewing and R. M. Meade, Assistants.

DRUG PLANT, POISONOUS PLANT, AND GENERAL PHYSIOLOGICAL INVESTIGATIONS.

RODNEY H. TRUE, *Physiologist in Charge*.

This branch of the Bureau is engaged in the study of a wide diversity of problems, covering the commercial culture of drug-producing crops and tea, the study of stock-poisoning plants and methods of preventing the losses caused thereby, and investigations in general plant physiology.

The scientific staff, under Doctor True's direction, includes W. W. Stockberger and C. Dwight Marsh, Physiologists; Heinrich Hasselbring, Expert; Carl L. Alsberg, H. H. Bartlett, Otis F. Black, Frank Rabak, and A. F. Sievers, Chemical Biologists; and A. B. Clawson, Alice Henkel, S. C. Hood, G. F. Klugh, G. F. Mitchell, Ivar Tidestrom, and T. B. Young, Assistants.

AGRICULTURAL TECHNOLOGY.

N. A. COBB, *Technologist in Charge*.

These investigations deal with the improvement of technological methods in crop production, the standardization of cotton, the testing of plants believed to be suitable for paper manufacture, and the encouragement of plant-fiber industries.

The scientific staff, under Doctor Cobb's direction, includes Lyster H. Dewey, Botanist; Charles J. Brand, Physiologist; and W. P. Barbot, R. L. Bennett, and W. E. Chambers, Experts.

TAXONOMIC AND RANGE INVESTIGATIONS.

FREDERICK V. COVILLE, *Botanist in Charge*.

This office maintains the economic collections of cultivated plants, and is engaged in systematic studies of grasses and other economic plants, the compilation of information on native plants for publication, the testing of wild and little-known plants, and experiments with a view to the improvement of the grazing areas on the National Forests.

The scientific staff, under Mr. Coville's direction, includes W. F. Wight, Botanist; A. S. Hitchcock, Systematic Agrostologist; W. E. Safford, Assistant Curator; P. L. Ricker, Assistant Botanist; and Agnes Chase, Assistant.

SEED-TESTING LABORATORIES.

EDGAR BROWN, *Botanist in Charge*.

These laboratories are charged with the examination of samples of commercial seeds for the presence of adulteration, and with a general propaganda in the interest of pure seed for the farmer. The work is conducted both in Washington, D. C., and at cooperative branch laboratories in the field.

The scientific staff, under Mr. Brown's direction, includes F. H. Hillman, Assistant Botanist; and W. L. Goss, Assistant.

GRAIN STANDARDIZATION.

JOHN D. SHANAHAN, *Technologist in Charge.*

This work consists of a study of the present systems of grading grain and the encouragement of the use of improved and more exact methods. The work is conducted both in Washington, D. C., and at branch laboratories at the principal grain centers.

The scientific staff, under Mr. Shanahan's direction, includes J. W. T. Duvel, Assistant in charge of laboratory methods; and Clyde H. Bailey, H. J. Besley, E. G. Boerner, W. P. Carroll, J. H. Cox, Laurel Duval, L. M. Jeffers, R. C. Miller, E. L. Morris, E. C. Richey, Philip Rothrock, and A. M. Satre, Assistants.

GRAIN INVESTIGATIONS.

MARK A. CARLETON, *Cerealist in Charge.*

This work deals with the culture, adaptation, and improvement of all cereal crops, especially those suited for cultivation in the arid and semiarid West. The study and prevention of the diseases affecting cereals are also a part of the investigations.

The scientific staff, under Mr. Carleton's direction, includes C. R. Ball, H. B. Derr, and C. W. Warburton, Agronomists; E. C. Johnson, Pathologist; C. E. Chambliss, Expert; J. F. Ross, Farm Superintendent; H. F. Blanchard and H. J. C. Umberger, Assistant Agronomists; V. L. Cory and W. G. Shelley, Assistants; E. L. Adams, Special Agent; F. R. Babcock, Assistant; L. C. Burnett, Manley Champlin, and J. M. Jenkins, Special Agents; A. A. Potter, Assistant Plant Pathologist; and Cecil Salmon, Special Agent.

CORN INVESTIGATIONS.

CHARLES P. HARTLEY, *Physiologist in Charge.*

These investigations have for their objects the improvement of the corn crop by breeding and selection and the use of improved methods in cultivating and caring for the crop. Both field corn and sweet corn are being studied.

The scientific staff, under Mr. Hartley's direction, includes Ernest B. Brown and Curtis H. Kyle, Assistant Physiologists; and L. L. Zook, Assistant.

TOBACCO INVESTIGATIONS.

W. W. GARNER, *Physiologist in Charge.*

This work has reference to the improvement of tobacco by hybridization and selection, the improvement of methods of growing and handling the crop, the combating of diseases, and the general study of the tobacco-growing industry. Experiments and demonstrations in the growing of tobacco in rotation with farm crops are features of the work.

The scientific staff, under Doctor Garner's direction, includes E. H. Mathewson, W. W. Green, G. W. Harris, and W. M. Hinson, Crop Technologists; Otto Olson, Expert; and H. C. Woosley, Agent.

PLANT NUTRITION AND GENERAL PLANT BREEDING INVESTIGATIONS.

W. W. GARNER, *Physiologist in Charge.*

This work is concerned with the improvement of various crops, such as asparagus, winter cover crops, etc., and also with the study of the general problems in plant nutrition, with special reference to cotton and tobacco.

The scientific staff, under Doctor Garner's direction, includes H. A. Allard, Assistant.

SUGAR-BEET INVESTIGATIONS.

W. A. ORTON, *Pathologist in Charge.*

These investigations cover all problems relating to the culture of sugar beets, such as the combating of diseases, the improvement of the yield and quality of the crop, the extension of sugar-beet culture, and the improvement of methods of growing and handling the crop.

The scientific staff, under Mr. Orton's direction, includes Howard A. Edson, Plant Physiologist; E. C. Rittue, H. B. Shaw, and J. F. Reed, Assistants; and Nellie A. Brown and Clara O. Jamieson, Laboratory Assistants. Investigations of the progress of the beet-sugar industry are conducted by Charles F. Saylor, Special Agent.

DRY LAND AGRICULTURE INVESTIGATIONS.

E. C. CHILCOTT, *Agriculturist in Charge.*

This work has reference to the development of proper cultural methods for the growing of crops in the semiarid regions of the West, especially in that portion known as the Great Plains Area. The objects are to determine the best methods of soil preparation and crop rotation for the conservation of moisture and the maintenance of humus in the soil.

The scientific staff, under Professor Chilcott's direction, includes J. S. Cole, Expert; W. W. Burr, E. F. Chilcott, O. J. Grace, F. L. Kennard, A. L. Hallsted, Clarence Plath, H. R. Reed, and John Thysel, Assistants; and J. M. Stephens, Special Agent.

WESTERN AGRICULTURAL EXTENSION.

CARL S. SCOFIELD, *Agriculturist in Charge.*

This work is concerned with the development of profitable agriculture on the lands to be placed under irrigation in the western United States, and also with the testing of various crops suited for growth under irrigation. All of the work is closely related to that of the Office of Dry Land Agriculture Investigations.

The scientific staff, under Mr. Scofield's direction, includes C. A. Jensen, Agriculturist; F. B. Headley, Assistant Agriculturist; A. M. Hawley, Fritz Knorr, and O. R. Matthews, Experts; Beyer Aune and J. P. Irish, jr., Special Agents; and S. H. Hastings and W. A. Peterson, Farm Superintendents.

ALKALI AND DROUGHT RESISTANT PLANT BREEDING INVESTIGATIONS.

T. H. KEARNEY, *Physiologist in Charge.*

The object of this work is to develop, by breeding and selection, strains of field crops which will be more resistant to alkali and drought than the varieties now obtainable. All of the work is conducted in close cooperation with the other branches of the Bureau concerned with the upbuilding of agriculture in the West and Southwest.

The scientific staff, under Mr. Kearney's direction, includes H. L. Shantz, Plant Physiologist, and A. C. Dillman, Assistant Plant Physiologist.

PHYSICAL LABORATORY.

LYMAN J. BRIGGS, *Physicist in Charge.*

This laboratory has for its objects the working out of physical problems in dry land agriculture, the development of improved apparatus for use in agricultural work, and the study of physical questions involved in the nutrition of crops, the resistance of plants to disease, etc.

The scientific staff, under Dr. Briggs's direction, includes J. O. Belz, Assistant; and J. W. McLane and Julia R. Pearce, Laboratory Assistants.

FARM MANAGEMENT.

W. J. SPILLMAN, *Agriculturist in Charge.*

This office studies the details of farm practice. Its main object is to improve farm practice by introducing better business methods and by applying the principles of science wherever they are known. The types of farming prevailing in the various sections of the country are being studied, and demonstrations in the form of object lessons are being made in a number of localities. A de-

tailed study of farm economics and business principles is being made in all sections of the United States. Studies of range management and of the use of the cactus as a forage plant are also a part of the work.

The scientific staff, under Professor Spillman's direction, includes D. A. Brodie, David Griffith, and C. B. Smith, Agriculturists; Levi Chubbuck, Expert; J. H. Arnold, Assistant; M. E. McCulloch, A. D. McNair, G. E. Monroe, Harry Thompson, and E. H. Thompson, Experts; J. C. Beavers, G. A. Billings, M. C. Burritt, J. S. Cates, J. S. Cotton, H. R. Cox, M. A. Crosby, D. H. Doane, L. G. Dodge, J. A. Drake, J. W. Froy, C. L. Goodrich, Byron Hunter, H. B. McClure, J. C. McDowell, H. A. Miller, H. H. Mowry, W. A. Peck, J. A. Warren, and B. Youngblood, Assistant Agriculturists; and C. M. Bennett, M. O. Bugby, E. L. Hayes, A. G. Smith, E. A. Stanford, and G. J. Street, Special Agents.

FARMERS' COOPERATIVE DEMONSTRATION WORK.

SEAMAN A. KNAPP, *Special Agent in Charge.*

This work consists of practical demonstrations in those parts of the cotton-growing territory infested, or likely to be infested, by the boll weevil. These demonstrations have as their objects the diversification of crops and the improvement of cultural methods, in order to show the farmers how best to meet the new conditions brought about by the advent of the boll weevil.

The staff engaged in the demonstration work, under Doctor Knapp's direction, includes J. P. Campbell, Bradford Knapp, O. B. Martin, W. B. Mercier, and H. E. Savely, General Agents; W. D. Bentley, L. N. Duncan, J. A. Evans, P. P. Garner, W. F. Procter, J. L. Quicksall, and R. S. Wilson, State Agents; and a corps of field agents.

ARLINGTON EXPERIMENTAL FARM AND HORTICULTURAL INVESTIGATIONS.

L. C. CORBETT, *Horticulturist in Charge.*

The Arlington Farm is the field laboratory at Washington for the Bureau of Plant Industry, as well as for many other Bureaus of the Department. A wide variety of field tests are conducted on the farm. The horticultural investigations are carried on both at the farm and in various trucking sections of the country, and include the testing and improvement of nearly all varieties of garden vegetables. Some work on the culture of fruits and flowers is also being conducted.

The scientific staff, under Professor Corbett's direction, includes W. W. Tracy, sr., Superintendent of Vegetable Testing; William Stuart, D. N. Shoemaker, and J. Walter Jones, Experts; E. C. Butterfield, Superintendent of Arlington Farm; W. R. Beattie, Assistant Horticulturist; and W. V. Shear, Assistant.

POMOLOGICAL COLLECTIONS.

G. B. BRACKETT, *Pomologist in Charge.*

This office is charged with the maintenance of economic collections of pomological material, the identification and description of fruit varieties, the simplification of nomenclature, and the collection and dissemination of general information regarding the fruit interests of the United States.

FIELD INVESTIGATIONS IN POMOLOGY.

WM. A. TAYLOR, *Pomologist in Charge.*

These investigations are concerned with the improvement of methods of growing and handling perishable fruits. The work is subdivided into fruit-marketing investigations; fruit transportation and storage investigations; fruit district investigations; grape investigations; and miscellaneous investigations, such as those bearing on pecan culture and on the improvement of citrus fruits in California and hardy fruits in the Northwest.

The scientific staff, under the direction of Mr. Taylor, includes H. P. Gould and G. C. Husmann, Pomologists; A. D. Shamel, Physiologist; A. V. Stubenrauch, S. J. Dennis, J. E. Buck, A. W. McKay, C. G. Patten, C. S. Pomeroy, and H. J. Ramsey, Experts; W. F. Fletcher, H. C. Gore, B. B. Pratt, C. W. Mann, and Chas. Dearing, Assistants; F. L. Husmann, Viticultural Superintendent; and C. A. Reed, Special Agent.

EXPERIMENTAL GARDENS AND GROUNDS.

E. M. BYRNES, *Superintendent*.

This office is charged with the care and ornamentation of the Department grounds, the maintenance of greenhouses and plant collections, and the propagation of plants for distribution and for other purposes. Experimental work with florists' crops is also being conducted in the greenhouses.

FOREIGN SEED AND PLANT INTRODUCTION.

DAVID FAIRCHILD, *Agricultural Explorer in Charge*.

This branch of the Bureau is concerned with the introduction and establishment of new plant industries. Promising new seeds and plants are secured both by agricultural exploration and by correspondence, and these are tested at the plant introduction gardens or through cooperation with individuals. Investigations in plant propagation and in the development of improved barleys and other crops are features of the work.

The scientific staff, under Mr. Fairchild's direction, includes Frank N. Meyer, Agricultural Explorer; P. H. Dorsett, Albert Mann, George W. Oliver, Walter Van Fleet, Peter Bisset, and H. F. Schultz, Experts; H. V. Harlan, H. C. Skeels, and R. A. Young, Assistants; and Edward Goucher and P. J. Wester, Gardeners.

FORAGE CROP INVESTIGATIONS.

C. V. PIPER, *Agrostologist in Charge*.

This work deals with the encouragement of forage crop industries and the propagation and dissemination of new and valuable varieties of forage plants. The distribution of seed is a prominent feature of this work, as is the testing and improvement of both standard and little-known forage crops.

The scientific staff, under Professor Piper's direction, includes J. M. Westgate, Agronomist; R. A. Oakley, Assistant Agrostologist; S. M. Tracy, Special Agent; and A. B. Conner, A. B. Cron, M. W. Evans, Roland McKee, W. J. Morse, and H. N. Vinall, Assistants.

CONGRESSIONAL SEED DISTRIBUTION.

(Directed by Chief of Bureau.)

This work consists of the securing, packeting, and mailing of the quantities of vegetable, flower, and other seeds and plants necessary for congressional distribution, as well as the propagation and distribution of improved seed of various crops.

The work is conducted, under the direction of the Chief of Bureau, by Leon M. Estabrook, Assistant, in general charge; and J. E. W. Tracy, Assistant Superintendent.

SOUTH TEXAS GARDEN, BROWNSVILLE, TEX.

EDWARD C. GREEN, *Pomologist in Charge*.

This garden has for its objects the testing and distribution of seeds and plants believed to be adapted for culture in south Texas, and the general improvement of the agriculture of that region. Advice regarding the prospects of success with various crops is furnished to settlers or to persons contemplating the purchase of land.

FOREST SERVICE.

Forester, HENRY S. GRAVES; *Associate Forester*, ALBERT F. POTTER.

The Forest Service collects and disseminates information of practical value bearing on the maintenance, improvement, extension, and utilization of American forests; examines into and reports on the desirability of creating new National Forests on public lands, and of extending or modifying the present Forest boundaries, and makes suggestions to timber-land owners, public and

private, to secure the introduction and practice of forest management. It has the technical and business management of the National Forests, exercising, under the direction of the Secretary of Agriculture, jurisdiction in all matters involved in the protection, use, and occupancy of the Forests, including the free use of timber and stone, timber sales, grazing, rights of way, and other uses.

The Service prepares working plans for the conservative lumbering of National, State, and private forests, and supervises their execution. It studies commercially valuable trees to determine how, under forestry, their continued production may be secured and their yield increased; investigates the relation between the forest and fire, grazing, lumbering, stream flow, and irrigation; ascertains and recommends trees and methods suitable for protective and productive planting in different regions; reforests denuded areas on the National Forests, and makes practical suggestions to tree planters; tests the strength and durability of construction timbers, railroad ties, and other materials, and the relative value of different methods of preservative treatment of timber; conducts inquiries into forest products, improvements in the methods of securing them, the saving of waste in their manufacture, and new sources of supply.

The field work of the Service includes the study of forest conditions and problems all over the country; the mapping of large areas of timber land, chiefly on the public domain, to show the character and utility of the growth; investigations of the grazing and fire problems in the National Forests and elsewhere; the giving of advice to owners of forest lands, and to farmers and others in need of planted forest growth for protection or wood supply, and the supervision of conservative lumbering operations, which illustrate forest management on business principles. The land for the management of which the advice of the Service has been asked and furnished is in many tracts, large and small, and is owned by individuals, clubs, corporations, several of the States, and the United States Government.

The work of the Forest Service is organized under the Office of the Forester, five branches, and six districts. The Office of the Forester includes, Inspection, Office of the Editor, Dendrology, and Accounts. The Branches are: Operation, which includes the Offices of Geography and Maintenance; Silviculture, which includes the Offices of State and Private Cooperation, and Silvics; Lands, which includes the Offices of Occupancy and Claims; Grazing; and Products, which includes the Office of Wood Utilization and the Forest Products Laboratory. The district offices are located as follows: District 1, Missoula, Mont.; District 2, Denver, Colo.; District 3, Albuquerque, N. Mex.; District 4, Ogden, Utah; District 5, San Francisco, Cal.; District 6, Portland, Oreg. Each District Office is organized under a District Forester and four offices. The Offices are Operation, Silviculture, Grazing, and Products.

INSPECTION.

(Under the direction of the Forester and Associate Forester.)

D. D. BRONSON, *General Inspector*.

Inspection covers only questions of special importance on the National Forests and elsewhere in the work of the Forest Service.

OFFICE OF THE EDITOR.

HERBERT A. SMITH, *Editor*.

Under the Editor are:

Publication—Bristow Adams, in Charge—which in general has charge of all the editorial and educational work of the Service, including the technical and literary review of its publications, cooperation with teachers and officers of public instruction in bringing home the lessons of forestry through school instruction, and the preparation, installation, and care of forest exhibits.

Information—Herbert A. Smith, in charge—which plans the lines along which the Forest Service makes known to the public the practical results of its work, answers requests for material for publication, and prepares statements concerning forests and forest products and their use.

DENDROLOGY.

GEORGE B. SUDWORTH, *Dendrologist*.

This line of work comprises all matters pertaining to the life history of forests and forest trees including technical studies of the distinguishing character-

istics of tree species and their woods. Special attention is given to the geographical and commercial distribution of tree species and forests, and to the investigation of forest resources, which includes investigations of forest areas to determine the kinds, quality, and quantity of timber available.

ACCOUNTS.

[Division of Accounts and Disbursements, Forest Service Branch.]

M. E. FAGAN, *Chief*; E. A. MELZAR, *Assistant Chief*.

Appointments, promotions, furloughs, and leave without pay, and all records of annual leave of members of the Service whose headquarters is Washington, as well as letters of authorization, are prepared and kept in this office. Payment of the salaries and expenses of those engaged in investigative work on the National Forests and whose headquarters is Washington, and the compilation of the reports of the District Fiscal Agents, which need to be combined before being submitted to the Treasurer, or the Secretary of Agriculture, is also handled by this office.

Branch of Operation.

JAMES B. ADAMS, *Assistant Forester in Charge*; CLYDE LEAVITT, *Assistant Forester*; G. G. ANDERSON, *Assistant in Office Methods*.

Through the District Foresters, Operation has general supervision of the organization, maintenance, and equipment of the personnel, and of all permanent improvement work on National Forests. In addition it includes the following offices:

GEOGRAPHY.

FRED G. PLUMMER, *Chief*.

The work of this office includes the collection and preservation of maps, the compilation of general maps and folios for the Forest Atlas, and the supervision of the engraving and printing of maps and diagrams. The tabulation of Forest statistics is included in the duties of this office. Upon the request of Forest officers and independently it also collects and records the status of lands within the National Forests. The photographic work of the Service, including the preparation of transparencies, bromides, and lantern slides, also comes under Geography.

MAINTENANCE.

GEO. A. BENTLEY, *Chief*.

Under Maintenance is included the care of quarters, supervision of the purchase of supplies, custody of field instruments and equipment, of office supplies and furniture, the maintenance of a sufficient force of stenographers to do all stenographic and mimeographic work of the Service which is not done by office stenographers, and to furnish upon application details of stenographers to other offices and sections in the absence of those regularly assigned.

Branch of Silviculture.

WILLIAM T. COX, *Assistant Forester in Charge*; E. E. CARTER, *Assistant Forester*.

STATE AND PRIVATE COOPERATION.

J. G. PETERS, *Chief*.

The Office of State and Private Cooperation investigates conditions on privately owned timber lands, and furnishes information concerning the conservative management of woodlands and the best species and methods to be used in planting denuded lands. In cooperation with the States it investigates forest conditions and suggests needed State legislation and forest policies.

SILVICS.

RAPHAEL ZON, *Chief*.

The Office of Silvics deals mainly with the general scientific problems underlying the practical management of National and private Forests. It investigates

the factors controlling the distribution of forests and forest trees throughout the United States, the relation of forests to stream flow and climate, and the conditions under which natural regeneration of cut-over, burned-over, or otherwise denuded areas takes place. It also studies the different requirements which commercial or otherwise important species have upon climate, soil, moisture, and light. The library of the Forest Service is connected with this office. It contains 12,200 books and pamphlets on forestry and allied subjects, 29,641 photographs of trees and forest conditions, and 4,500 lantern slides.

Branch of Lands.

JAMES B. ADAMS, *Assistant Forester, in Charge.*

OCCUPANCY.

W. W. DYAR, *in Charge.*

Occupancy has charge of all matters relating to the uses of National Forest land, not already covered by Silviculture and Grazing. These include reports upon rights-of-way projects to the Department of the Interior, the special study and compilation of forest laws, and reports and correspondence upon Federal and State forest legislation.

CLAIMS.

J. I. PARKER, *in Charge.*

This office administers all matters relating to claims on the National Forests, prior to proceedings before registers and receivers on hearings ordered, and cooperates with the Office of the Solicitor in procuring necessary evidence to sustain the Department's contests. This office also administers all matters relating to the Act of June 11, 1906, the acquisition of administrative sites, and, when requested by the Forester, additions to and eliminations from National Forests.

Branch of Grazing.

ALBERT F. POTTER, *Associate Forester in Charge*; LEON F. KNEIPP, *Assistant Forester*; WILL C. BARNES, *Inspector of Grazing.*

The Branch of Grazing has, through the District Forester, general supervision of the range in the National Forests. When the number of stock to be allowed on each National Forest has been determined by the Secretary of Agriculture the Branch of Grazing establishes the periods during which grazing will be allowed, the grazing fees to be charged, and determines the general grazing districts into which the National Forests will be divided and the kind of stock which may be grazed upon them. It also has charge of all scientific investigations which concern the best use of the forage resources of the National Forests.

Branch of Products.

WM. L. HALL, *Assistant Forester in Charge.*

LABORATORY.

MCGARVEY CLINE, *Director.*

A Forest Products Laboratory is maintained in cooperation with the University of Wisconsin, at Madison, Wis. The Laboratory conducts the following classes of experimental investigations in the utilization of forest products: (1) The investigation of problems in experimental research; (2) Experimental work in cooperation with commercial operations to verify laboratory experiments on a commercial scale; (3) Cooperation with individuals or companies to assist them in applying principles and processes of proved commercial value.

The lines of work pursued are as follows:

Wood Preservation, which includes the study of all problems related to the impregnation of wood with preservatives and other substances.

Wood Chemistry, which covers all work bearing on the chemical utilization of forest products. Wood Distillation, paper pulp, and other fiber products, chemical analyses of creosotes, turpentine, etc., are the principal lines.

Timber Tests, including the charge of all tests to determine the strength and other mechanical properties of different woods.

Technology, covering the study of the microscopic structure of wood, methods of seasoning and drying it, and other problems of a purely technical character.

Maintenance, which includes filing, computing, the purchase of supplies, and general care of the entire laboratory.

WOOD UTILIZATION.

H. S. SACKETT, *in Charge*.

(Fisher Building, Chicago, Ill.)

The work of this office is to further by statistical investigation the use of materials which come from the forest. The work consists of studies of the wood-using industries of various States, the study of woods used in manufacture, and of the methods of disposing of mill waste, the collection of statistics on the price of lumber at the mill and at the principal distributing markets of the country, and the study of specifications and grading rules. The office also secures statistics of forest products of importance to the experimental work of the Service and studies the movements of lumber to and from the principal lumber markets. O. T. Swan is in charge of the Washington, D. C., office.

Districts.

DISTRICT 1.—W. B. GREELY, *District Forester*; F. A. SILCOX, *Associate District Forester*. Office at Missoula, Mont.

DISTRICT 2.—SMITH RILEY, *District Forester*; P. G. REDINGTON, *Associate District Forester*. Office at Denver, Colo.

DISTRICT 3.—A. C. RINGLAND, *District Forester*; E. H. CLAPP, *Associate District Forester*. Office at Albuquerque, N. Mex.

DISTRICT 4.—E. A. SHERMAN, *District Forester*; FRANKLIN W. REED, *Associate District Forester*. Office at Ogden, Utah.

DISTRICT 5.—F. E. OLMSTED, *District Forester*; COERT DUBOIS, *Associate District Forester*. Office at San Francisco, Cal.

DISTRICT 6.—C. S. CHAPMAN, *District Forester*; GEORGE H. CECIL, *Associate District Forester*. Office at Portland, Oreg.

OPERATION.

DISTRICT 1.—J. P. MARTIN, *Chief*; E. W. KRAMER, *Assistant Chief*.

DISTRICT 2.—FRED W. MORRELL, *Chief*; NILE HUGHEL, *Assistant Chief*.

DISTRICT 3.—A. O. WAHA, *Chief*; A. S. PECK, *Assistant Chief*.

DISTRICT 4.—A. C. MCCAIN, *Chief*; A. T. MITCHELSON, *Assistant Chief*.

DISTRICT 5.—ROY HEADLEY, *Chief*.

DISTRICT 6.—C. H. FLORY, *Chief*; W. E. HERRING, *Assistant Chief*.

The Office of Operation in each District has charge of the protection of the National Forests, the organization, maintenance, and equipment of the personnel, and the supervision of all permanent improvement work. It recommends to the District Forester changes in the area of existing Forests and the creation of new Forests; and it has charge of the special-use business of the District and the maintenance of files and other equipment.

SILVICULTURE.

DISTRICT 1.—R. T. STUART, *Chief*; D. T. MASON, *Assistant Chief*.

DISTRICT 2.—S. L. MOORE, *Assistant Chief*.

DISTRICT 3.—T. S. WOOLSEY, Jr., *Chief*; A. B. RECKNAGEL, *Assistant Chief*.

DISTRICT 4.—L. L. WHITE, *Chief*.

DISTRICT 5.—T. D. WOODBURY, *Assistant Chief*.

DISTRICT 6.—F. E. AMES, *Chief*; C. S. JUDD, *Assistant Chief*.

The Office of Silviculture in each District has charge of the sale and free use of timber, of all planting work, and of all silvical studies on the National Forests within the District. It also has charge of all work within the District similar to that done on forest lands outside the Districts by the offices of Federal Cooperation and State and Private Cooperation at Washington.

GRAZING.

- DISTRICT 1.—C. H. ADAMS, *Chief*; W. S. PERRINE, *Assistant Chief*.
 DISTRICT 2.—J. W. NELSON, *Chief*; E. N. KAVANAGH, *Assistant Chief*.
 DISTRICT 3.—J. K. CAMPBELL, *Chief*; JOHN KERR, *Assistant Chief*.
 DISTRICT 4.—HOMER E. FENN, *Chief*; G. G. BENTZ, *Assistant Chief*.
 DISTRICT 5.—JOHN H. HATTON, *Chief*; M. B. ELLIOTT, *Assistant Chief*.
 DISTRICT 6.—HOWARD K. O'BRIEN, *Chief*; T. P. MCKENZIE, *Assistant Chief*.

The Office of Grazing in each District has supervision of all grazing matters upon the National Forests under the allowances, periods, rates, and general range divisions established by the Branch of Grazing according to existing regulations.

PRODUCTS.

- DISTRICT 2.—H. S. BETTS, *Chief*.
 DISTRICT 5.—C. S. SMITH, *Chief*.
 DISTRICT 6.—J. B. KNAPP, *Chief*.

The Office of Products in each District has charge of the work within the District similar to that done outside the Districts by the offices of Wood Utilization and the Forest Products Laboratory.

BUREAU OF CHEMISTRY.

Chief, HARVEY W. WILEY; F. L. DUNLAP, *Associate Chemist and Acting Chief in the absence of the Chief*.

The Bureau of Chemistry confines its attention to questions of agricultural chemistry of public interest and other chemical investigations referred to it by the Government. Such investigations include studies on the effects of storage on foods, especially on drawn and undrawn poultry, eggs, etc., and physiological experiments to determine the effects of food preservatives and artificial colors on health and digestion. The examination of samples of foods and drugs under section 4 of the Food and Drugs Act, June 30, 1906, constitutes an important part of the work. The Chief of the Bureau is Chairman and the Associate Chemist is Secretary of the Board of Food and Drug Inspection (see p. 49), which conducts or has supervision of all hearings afforded interested parties, as provided in section 4 of the Food and Drugs Act, and passes on questions of importation of foods and drugs, under section 11 of the same act. Inquiries of value to individuals only, or to a small group of individuals, can not be considered. In general, the Bureau is unable to examine miscellaneous samples sent to it for that purpose. The Bureau, by direction of the Secretary, has charge of all of the chemical work of the Department not otherwise provided for by law. In the absence of the Chief, the Associate Chemist is Acting Chief of Bureau.

ENFORCEMENT OF THE FOOD AND DRUGS ACT.

While all the divisions and laboratories cooperate to a greater or less degree in the analytical work contingent upon the inspection of foods and drugs, the Bureau organization directly concerned in the administration of the law is as follows:

The Division of Foods is in charge of the analytical work on foods performed at the central Bureau in the enforcement of the law, makes check analyses on doubtful samples referred to it by the food and drug inspection laboratories, and renders the final decision as to the analytical results, so far as the Bureau of Chemistry is concerned. In general, this work is done in the Washington Food Inspection Laboratory of the Division of Foods, L. M. Tolman, *Chief*. The Division of Drugs performs the same work in regard to drugs, medicines, etc., and the Miscellaneous Division has charge of the water and cattle food work under the law.

The Chief of the Division of Foods, who is also Assistant Chief of Bureau, installs the inspection laboratories and has charge of the administrative detail in connection with their work, although the chiefs of these laboratories report directly to the Chief of Bureau, who is charged by the Secretary with the details of Bureau administration involved. Food and drug inspection laboratories have been established at the following points: New York, R. E. DOOLITTLE, *Chief*;

Boston, B. H. SMITH, *Chief*; Philadelphia, C. S. BRINTON, *Chief*; Chicago, A. L. WINTON, *Chief*; New Orleans, C. W. HARRISON, *Chief*; San Francisco, R. A. GOULD, *Chief*; St. Paul, A. S. MITCHELL, *Chief*; Detroit, H. L. SCHULZ, *Chief*; Savannah, W. C. BURNET, *Chief*; Seattle, H. M. LOOMIS, *Acting*; Buffalo, W. L. DUBOIS, *Acting*; Kansas City, Mo., A. V. H. MORY, *Chief*; Denver, A. E. LEACH, *Chief*; Galveston, T. F. PAPPE, *Acting*; Portland, Oreg., A. L. KNISELY, *Chief*; Cincinnati, B. R. HART, *Chief*; Omaha, S. H. ROSS, *Chief*; Nashville, R. W. BALCOM, *Acting*; Honolulu, H. I., EDWARD BLANCHARD, *Acting*; Pittsburg, M. C. ALBRECH, *Chief*, and St. Louis, D. B. BISBEE, *Chief*.

OFFICE OF CHIEF INSPECTOR.

The corps of 40 inspectors, under a Chief Inspector, W. G. Campbell, who reports directly to the Chief of Bureau, has headquarters at Washington, and the inspectors receive their directions from and make their reports to the Chief Inspector at that point. The taking of samples for analysis constitutes their chief duty, though special investigations in collaboration with the chemists are also made, and factories where articles of food or drugs are prepared, are also inspected.

DIVISION OF FOODS.

W. D. BIGELOW, *Chief*.

Food Inspection Laboratory: L. M. TOLMAN, *Chief*. *Assistants*: M. BOYLE, A. M. DOYLE, E. H. GOODNOW, WM. E. HILLYER, R. C. KENT, J. I. PALMORE, H. E. SAWYER, A. L. SULLIVAN, and W. C. TABOR.

Food Technology Laboratory: E. M. CHACE, *Chief*, and *Assistant Chief of Division*. *Assistants*: C. O. DODGE, C. P. WILSON, and A. R. ALBRIGHT.

Oil, Fat, and Wax Laboratory: H. S. BAILEY, *Chief*.

The assistants working directly under the chief of the division are A. L. DAVISON, P. B. DUNBAR, H. C. GORE, and F. W. LIEPSNER.

The Division of Foods is charged with the food investigations made by the Bureau, and the laboratories named were created therein on July 1, 1908. In the past much work has been done with various kinds of food purchased in the open market, in order to determine their purity and the character of adulteration commonly practiced. Careful attention has long been given to this subject under the provisions of the appropriation act authorizing the Bureau of Chemistry to investigate the adulteration, false labeling, and false branding of food products.

Aside from the other inquiries mentioned, the Division of Foods studies analytical methods necessary for the examination of food. This work is partly done in collaboration with the Association of Official Agricultural Chemists, of which the Chief of the Bureau is the secretary. A detailed investigation of flavoring extracts and substances used in their manufacture, both abroad and in the United States, has been conducted by the assistant chief of division with a view to determining proper standards of purity for this product. Special studies are made from time to time of the influence of methods of manufacture and other conditions upon the composition and wholesomeness of food, with respect to the enforcement of the Food and Drugs Act.

H. C. GORE is in charge of special studies on fruits and fruit products conducted in cooperation with the Bureau of Plant Industry. The principal subjects of study at present are as follows: The cold storage of cider; the preparation of unf fermented juices from apples, grapes, and the small fruits; methods for the utilization of surplus peaches; the preparation of sugared, dried pineapple; and the treatment of Japanese persimmons by a modification of the Japanese method for rendering them nonastringent.

The work in connection with the enforcement of the Food and Drugs Act, June 30, 1906, naturally divides itself into two portions: First, the inspection of foods and drugs sold in the District of Columbia and the Territories or shipped in interstate commerce; second, the inspection of foods imported into the United States from foreign countries. The samples of foods collected in the vicinity of Washington are examined in the food-inspection laboratory of the Division of Foods, in which laboratory the results of the branch laboratories on condemned samples, whether imported or domestic, are also checked, with the exception of flavoring extracts which are examined in the Food Technology Laboratory.

DIVISION OF DRUGS.

L. F. KEBLER, *Chief*.Drug Inspection Laboratory, G. W. HOOVER, *Chief*.Synthetic Products Laboratory, W. O. EMERY, *Chief*.Essential Oils Laboratory, *under Chief of Division*.Pharmacological Laboratory, W. M. SALANT, *in Charge*.

This Division has for its object the study of the properties, composition, and quality of drugs and medicinal preparations of all kinds. A large part of its work consists in the study of official and new methods and the acquisition of data which may lead to more satisfactory and accurate analytical processes, especially for testing potent plant drugs and products derived from them. The Chief of the Drug Division, as Referee on Medicinal Plants and Drugs of the Association of Official Agricultural Chemists, has undertaken a collaborative study of drug assay methods. Many samples of manufactured pharmaceutical preparations have been examined for the Council of Pharmacy and Chemistry of the American Medical Association. The several departments of the Government submit samples of drug products to this division for examination, and, in accordance with the provisions of the appropriation act, many fraudulent medicinal products are investigated for the Post-Office Department. All chemical supplies bought on contract by the Bureau of Chemistry are examined in the Division of Drugs previous to their acceptance. Analyses of medicinal plants and other products are made for the Bureau of Plant Industry, and investigations are conducted in collaboration with the Bureau of Entomology, the Bureau of Fisheries of the Department of Commerce and Labor, and the Division of Foods of this Bureau.

A careful study of those medicinal remedies included in the United States Pharmacopoeia for which there are no methods of analysis or recognized standards at present, and of some remedies not so recognized, is now in progress for the purpose of developing methods of analysis and acquiring data upon which uniform methods and standards of composition, quality, and strength may be based. The change of composition or deterioration, due to age or other causes, of crude drugs and finished products is also studied. Investigations of all drug products or medicinal agents for adulteration and misbranding, as provided in section 4 of the Food and Drugs Act, June 30, 1906, are made in this Division or under its supervision, and similar investigations are also conducted in cooperation with the American Medical Association. A number of pharmaceutical chemists are stationed at the branch laboratories of the Bureau of Chemistry for the examination of drug products imported into the United States.

The following assistants comprise the scientific force of the Division of Drugs: F. M. Boyles, V. K. Chesnut, E. O. Eaton, H. C. Fuller, B. Herstein, G. W. Knight, C. C. Le Febvre, L. B. Mears, E. C. Merrill, F. P. Morgan, E. K. Nelson, C. E. Parker, J. B. Rieger, and R. R. Shively.

MISCELLANEOUS DIVISION.

J. K. HAYWOOD, *Chief*.

Water Laboratory, W. W. SKINNER, *Chief*; *Assistants*, W. D. COLLINS, D. C. DYER, P. J. Fox, J. B. REED, and J. W. SALE.

Cattle-food and Grain Laboratory, G. L. BIDWELL, *Acting Chief*; *Assistants*, C. E. GOODRICH and H. L. WALTER.

Insecticide and Fungicide Laboratory, C. C. McDONNELL, *Chief*; *Assistant*, R. C. ROARK.

Trade Waste Laboratory, *under Chief of Division*; *Assistant*, W. D. LYNCH.

This Division and the four laboratories therein were formally organized by the Secretary under date of July 1, 1908, marking the logical growth and expansion of several lines of work, which were originally authorized in the Insecticide and Water Laboratory and reorganized under order of the Secretary July 1, 1905, as the Miscellaneous Laboratory. The principal lines of work are the examination and study of waters, cattle foods, forage crops, grains, insecticides and fungicides, trade wastes, and certain hygienic problems; also such miscellaneous chemical work of the Bureau of Chemistry and of other Bureaus and divisions of various Departments of the Government as

may be referred to this Division and which does not properly belong to other established laboratories. The work on waters includes the chemical examination and study of mineral waters, irrigating waters, waters for sanitary, technical, and domestic purposes, and of the potable and medicinal waters found bottled on the market, for the purpose of securing data for use in connection with the enforcement of the Food and Drugs Act of June 30, 1906. In collaboration with the Office of Grain Investigation of the Bureau of Plant Industry, studies are made of the relative food value, milling and baking qualities, and general commercial importance of grains, together with the adaptability of certain grains to specific purposes. Cattle foods are studied in order to secure data for use in connection with the enforcement of the Food and Drugs Act. There are being made, in collaboration with the Bureau of Entomology, experiments to determine the efficiency of certain insecticides and their effect upon foliage, and, in collaboration with several experiment stations, studies of more complete methods of analysis. Special investigations are being made of the effect of smelter fumes upon plants and animals and the injury to vegetation and soils by the contamination of irrigating waters by mining wastes.

CONTRACTS LABORATORY.

P. H. WALKER, *Chief.*

The Contracts Laboratory examines materials to be purchased by the United States Department of Agriculture to determine their purity and compliance with specifications, and does collaborative work with other Departments. The work of this laboratory consists largely of the examination of materials submitted with bids for contracts or furnished on contract for the various executive departments. It includes also the examination of a large number and variety of materials regarding which there has arisen some question of classification for dutiable purposes. An important line of work is an investigation of paints, in cooperation with the Geological Survey and the Forest Service.

Among the more important lines of contracts work may be mentioned the investigation and examination of post-mark and canceling inks, inking pads, glue, glycerin, soap, lubricating oils, and linoleum used by the Post-Office Department; of disinfectants, lubricating oils, and chemicals used by the Government Hospital for the Insane; of dry colors, oils, glue, soap, steel, and miscellaneous supplies used by the Bureau of Engraving and Printing; of gums, oils, and alloys used by the Government Printing Office; of writing inks, typewriter ribbons, carbon papers, etc., used in the various executive departments where permanence of records is essential; of paints, oils, varnishes, soap, ink, typewriter ribbons, etc., for the General Supply Committee; of paints, oils, varnishes, chemical glassware and other apparatus used in the Department of Agriculture, and of supplies for the Commissary Office of the War Department and for the Isthmian Canal Commission, including paints, pigments, oils, metals, and miscellaneous supplies. The assistants in this laboratory are L. H. Bailey, E. W. Boughton, J. H. Bower, E. M. Dawson, jr., L. Feldstein, H. C. McNeil, F. W. Smither, H. A. Whitman, and G. C. Schmidt.

DAIRY LABORATORY.

G. E. PATRICK, *Chief.*

The Dairy Laboratory examines dairy products of every description and studies methods for making such examinations. A large part of the work at present is in connection with the enforcement of the Food and Drugs Act of 1906, in the examination of interstate samples of milk, condensed milk, ice cream, butter, and cheese, to determine questions as to their adulteration and mislabeling. Also under Section 11 of the same act referring to imported foods, this laboratory examines many samples of imported dairy products, mostly cheese, taken by the customs officers at the various ports of entry. Chemical examinations are made of the samples of butter taken by the Bureau of Animal Industry in its enforcement of the law of 1902, regulating the manufacture and sale of renovated butter. All kinds of dairy products are also examined for the same Bureau in its general survey of American markets. Samples of dairy products received from other sources are analyzed when such work promises to be of public benefit. The assistants in this laboratory are B. D. Johnson, J. T. Keister, W. J. Morgan, and J. G. Riley.

FOOD RESEARCH LABORATORY.

M. E. PENNINGTON, *Chief*.

The Food Research Laboratory was formally organized July 1, 1908, though it had existed as a laboratory for special investigations since April, 1907. With its formal establishment has come a broadening of its field of activity, which has been very largely confined to the study—chemical, bacteriological, and histological—of foods preserved by low temperatures, milk and poultry having been especially selected for study, directing attention chiefly to their decomposition and putridity in connection with the execution of the Food and Drugs Act, and also to the changes which go on in preserved foods, whether the means of preservation be cold, heat, chemical reagents, or desiccation. The assistants in this laboratory are A. D. Greenlee, J. S. Hepburn, E. Q. St. John, M. O. Stafford, and E. Witmer.

LEATHER AND PAPER LABORATORY.

F. P. VEITCH, *Chief*.

This laboratory conducts investigations of tannins and tanning materials and their effects upon the strength and properties of leather, with a view to promoting the agricultural industries relating to the production of tannins and tanning materials and leather of a high quality; all technical problems of a chemical nature relating to the production of tannins and tanning products; all technical problems of a chemical nature relating to the production of leather; all chemical and physical investigations of papers in regard to their fitness for use in the Department of Agriculture, and other Departments of the Government which may request such investigations; all technical problems of a chemical nature relating to the production of paper, with a view to promoting the agricultural industries connected with the production of the raw materials and to the improvement of the quality of papers made, and conserving paper-making materials; chemical-technical investigations of turpentine and resins for the purpose of determining their chemical nature and industrial uses and improving processes of production and the examination of turpentine and rosin under the Food and Drugs Act. Chemical-technical investigations of the destructive distillation of wood for the purpose of profitably utilizing waste and other woods, and to improve the quality and quantity of the products resulting therefrom; chemical-technical investigations of rubber for the purpose of determining the factors upon which values depend, and studies of methods of coagulation, and to increase the yield of crude rubber. Papers, leathers, turpentine, resins, and textiles are also examined for the Departments of the Government requesting such work, and specifications are prepared for the purchase of these articles. The assistants of this laboratory are M. G. Donk, H. P. Holman, J. L. Merrill, E. O. Reed, J. S. Rogers, C. F. Sammet, and C. F. Speh.

MICROCHEMICAL LABORATORY.

B. J. HOWARD, *Chief*.

This laboratory is charged with the microscopical and microchemical study of foods, drugs, cattle feed, paper and textile materials, miscellaneous agricultural products, etc. Special attention is given to the histological study of fruits, spices, cereals, starches, and other agricultural products, both on account of its scientific interest and for the purpose of perfecting methods for detecting the adulteration of these products. The laboratory makes microscopical examinations of the urine and blood in connection with the work of the Bureau on the influence of preservatives on nutrition, and cooperates with other branches of the Government in work of this character. The assistants of this laboratory are Kate G. Barber, Effie A. Read, C. H. Stephenson, and W. J. Young.

SUGAR LABORATORY.

A. H. BRYAN, *Chief*.

The Sugar Laboratory is charged with the chemical study of sugars and other carbohydrates. One of its duties is to examine the samples of sugar corn grown in collaboration with the agricultural experiment stations, to de-

termine the effect of environment upon the sugar content. The chemical work relating to the domestic sirup industry—that is, the manufacture of table sirup from the maple sap, sorghum, and sugar cane—is performed in the Sugar Laboratory, which also collaborates with the International Commission for Uniform Methods of Sugar Analysis in the standardization of international quartz plates for the control of polariscopes in different countries. Sugar beets grown in various parts of the country are also analyzed and the effect of environment upon composition is studied. In this connection a study is made of the methods of determining sugar in beets, and an examination of beet molasses from a large number of sugar factories is in progress.

In collaboration with the apiary division of the Bureau of Entomology, this laboratory is investigating the chemical changes occurring during the storage of honey and those produced by heating. A special study is also being made of the honeys imported into this country from the West Indies and Mexico, as was done with American honeys. The Sugar Laboratory also analyzes commercial malt sirups and diastatic preparations of malt. In connection with the work of the Contracts Laboratory, dextrins, glucoses, starches, and other carbohydrate materials used by the Bureau of Engraving and Printing are examined. The assistants in this laboratory are C. G. Church, A. Given, S. F. Sherwood, and M. N. Straughn.

SECTION OF ANIMAL PHYSIOLOGICAL CHEMISTRY.

F. C. WEBER, *in Charge*.

The work in this section includes metabolism and feeding studies with foods, with organic and inorganic compounds, and with various carbohydrates. The study of enzymes, especially in regard to their laws of action and their applicability to methods of analysis, forms an important feature of the investigations, together with experimental work to improve the methods of analysis ordinarily employed in physiological chemistry. The assistants in this section are F. C. Cook, H. W. Houghton, C. S. Hudson, and H. S. Paine.

SECTION OF BACTERIOLOGICAL CHEMISTRY.

G. W. STILES, JR., *in Charge*.

The investigations in bacteriological chemistry consist principally of the bacteriological examination of various food materials, together with the inspection of methods of handling and preparation, including milk, cream, ice cream, water, uncooked vegetables, and shellfish; also the bacterial content of fowls, fish, eggs, beef, game, etc., as affected by storage.

Considerable attention is devoted to testing the germicidal, antiseptic, and preservative value of certain drugs, chemicals, and fruit juices. Special consideration is also given to the identification and classification of the various bacteria, yeasts, and molds encountered in these investigations. Another line of work involves the examination of surgical dressings, gauzes, ligatures, etc., to determine their sterility. Cooperative work with other laboratories is done when required. The assistants in this section are C. Bates, Minnie Jenkins, and E. Le Fevre.

SECTION OF ENOLOGICAL TECHNOLOGY.

WM. B. ALWOOD, *in Charge*.

The investigations conducted in this section fall naturally into two divisions, one dealing with the study of alcoholic ferments and the mal-organisms associated with them in fruit musts, ciders, wines, and fruit by-products; the other with the composition of fruits and fruit juices and their fermented products and the critical examination of the residue which is left in the marc or pomace as a practically waste product.

In the fermentation study the pure cultures of the various organisms which occur in fruit musts or similar products, are separated. These organisms are isolated and their growth activities studied as alcoholic ferments or as mal-ferments which destroy the sugar, alcohol, acids, etc., which it is desired to produce.

The pure cultures which have given the greatest promise in Europe have been studied and compared with those isolated in this country. Having thus de-

terminated the vital activities, methods of control are studied, that the cultures of pure ferments may be utilized to produce the desired qualities in products manufactured from fruit juices, and either to suppress or destroy undesirable organisms. Cellar tests on the use of the pure cultures in comparison with each other and with unyeasted must are made, and also tests on the use of sulphur in the fermenting and handling of fruit juices in the cellar. These studies are conducted at Charlottesville, Va. The assistants in the work are J. R. Eoff, jr., and B. G. Hartmann.

NITROGEN SECTION.

T. C. TRESNOT, *in Charge*.

All nitrogen determinations for the several laboratories and divisions are made in the nitrogen section. Cooperative work with the Association of Official Agricultural Chemists is also done, looking to the improvement of the methods for making these determinations. The assistant is A. W. Broomell.

SECTION OF VEGETABLE PHYSIOLOGICAL CHEMISTRY.

J. A. LE CLERC, *Chief*.

The investigation in vegetable physiological chemistry includes studies of the chemistry of growing plants, the composition of cereals, etc., grown under different conditions with respect especially to climate and environment, both in the greenhouse and in the fields; the study of changes, chemical, physical, and physiological, taking place in grain during germination, malting, and storage; and studies in milling and breadmaking. Work is also done in collaboration with the various offices of the Bureau of Plant Industry. The assistants in this section are J. F. Breazeale, B. R. Jacobs, Ellen S. McCarthy, G. C. Spencer, and E. H. Walters.

SPECIAL INVESTIGATIONS.

(Under the direction of the Chief of Bureau.)

INFLUENCE OF ENVIRONMENT ON COMPOSITION OF AGRICULTURAL PRODUCTS.

This Bureau is especially studying the influence of environment upon the chemical composition of the sugar and starch producing plants. The need of further study of these subjects is generally recognized and in its prosecution the Bureau has the active collaboration of a number of the State experiment stations as well as the cooperation of the Bureau of Plant Industry. Studies on sugar corn are in progress by M. N. Straughn and C. G. Church.

MANUFACTURE OF DENATURED ALCOHOL.

A school of instruction in the manufacture of denatured alcohol was established in the Bureau in 1908, covering especially the subjects of yeasting, fermentation, distillation, and distillery operation. To illustrate the lectures on this subject and to demonstrate practically the principles taught, an experimental distillery was erected at the Bureau of Chemistry and was operated, using the usual raw materials, such as grains and potatoes, as well as various agricultural wastes. Members of the experiment stations and others interested were invited to attend this school and to take a practical course in the distillery with a view to encouraging the production of alcohol for denaturing purposes, especially in agricultural communities. This work, which was in charge of L. M. Tolman, H. E. Sawyer, and A. O. Wentz, collaborating as experts on fermentation, R. E. Lee, assisting, has been discontinued for lack of further appropriation.

BUREAU OF SOILS.

Soil Physicist and Chief of Bureau, MILTON WHITNEY; *Chief Clerk*, A. G. RICE.

The Bureau of Soils is charged with the investigation of the relation of soils to climate and organic life; with the investigation of the texture and composition of soils in field and laboratory; with the mapping of soils; with the study

of the cause and prevention of the rise of alkali in the soils of irrigated districts, and of the relations of soils to seepage and drainage conditions.

In addition to circulars and bulletins, the Bureau publishes annually the Report of the Field Operations of the Bureau of Soils. This contains a detailed description of the soils and of the agricultural conditions of the several areas surveyed, points out the present use of the soils, and discusses the possible changes and improvements in crops and methods of cultivation. Large scale lithograph maps showing the distribution of the different kinds of soils accompany each report.

Lists of publications of the Bureau may be obtained upon application.

LABORATORIES.

FRANK K. CAMERON, *Scientist, in Charge.*

The Laboratories have under their charge the investigation of the chemical properties of soils in their relation to plant growth; the chemical examination and analysis of soil types and the study of their requirements with regard to fertilizers; the investigation of alkali problems, and the general direction of chemical methods in use by field parties. The Laboratories are also charged with the investigation of the physical properties of soils and their economic bearing; the physical examination and mechanical analysis of soil types for soil-survey parties; the preparation and testing of apparatus used in field work; and the investigation from a physical standpoint of such mechanical soil problems as arise.

The Laboratory Assistants are as follows: J. M. Bell, H. Bryan, R. O. E. Davis, G. H. Failyer, C. C. Fletcher, E. E. Free, R. F. Gardiner, H. E. Patten, W. O. Robinson, J. G. Smith, W. H. Waggaman, W. J. McCaughey, W. B. Page, and C. C. Stark.

SOIL SURVEY.

JAY A. BONSTEEL, *Scientist, in Charge.*

The Soil Survey is charged with the surveying and mapping of the soils in selected areas in various parts of the United States; with the correlation of the soils of different parts of the country and their scientific classification; with the locating, mapping, and classifying of the soils of agricultural school farms and Experiment Station farms, in cooperation with various State organizations; with the study of the soil and alkali conditions in reclamation projects in cooperation with the U. S. Reclamation Service; with the reconnaissance survey of extensive areas; and with the preparation of maps and reports covering this work.

For the proper administration of the field work of the Soil Survey the country has been divided into four divisions, as follows: Eastern Division—H. H. Bennett, in Charge. Central Division—J. E. Lapham, in Charge. Great Plains Division—G. N. Coffey, in Charge. Western Division—Macy H. Lapham, in Charge.

Assistants in the Soil Survey are: R. T. Allen, F. Bennett, J. C. Britton, R. T. Avon Burke, W. C. Byers, M. E. Carr, W. T. Carter, jr., E. C. Eckmann, J. E. Ferguson, W. J. Gelb, R. B. Hardison, W. E. Hearn, A. L. Higgins, L. C. Holmes, H. Jennings, G. B. Jones, A. E. Kocher, L. A. Kolbe, W. J. Latimer, D. D. Long, C. Lounsbury, W. E. McLendon, A. W. Mangum, C. J. Mann, G. B. Maynadier, C. N. Mooney, J. W. Nelson, T. D. Rice, R. W. Rowe, H. C. Smith, W. G. Smith, A. T. Strahorn, A. T. Sweet, W. E. Tharp, C. Van Duyne, C. S. Waldrop, E. B. Watson, F. S. Welsh, H. L. Westover, H. J. Wilder, R. E. Willard, R. A. Winston, and P. O. Wood.

FERTILITY INVESTIGATIONS.

OSWALD SCHREINER, *Scientist, in Charge.*

The Division of Fertility Investigations has for its object the study of the causes of and remedy for infertility in certain soils, whether natural or arising from improper methods of cultivation and cropping. It is engaged in the separation, identification, and study of certain organic substances found in unproductive soils, and the correction of their evil effects by mechanical handling,

by the use of fertilizers, and by other methods available to the farmer. Assistants are: J. H. Beattie, F. C. Blanck, B. E. Brown, A. M. Jackson, E. C. Lathrop, F. R. Reid, E. C. Shorey, J. J. Skinner, M. X. Sullivan, and H. Winckelmann.

SOIL-WATER INVESTIGATIONS.

W. J. McGEE, *Expert in Charge.*

The Division of Soil-water Investigations has for its object the investigation of the relation of soils to drainage and seepage waters.

BUREAU OF ENTOMOLOGY.

Entomologist and Chief, L. O. HOWARD; *Assistant Entomologist and Acting Chief in absence of Chief*, C. L. MARLATT; *Executive Assistant*, R. S. CLIFTON; *Chief Clerk*, W. F. TASTET; *In Charge of Editorial Work*, ROLLA P. CURRIE.

The Bureau of Entomology obtains and disseminates information regarding injurious insects affecting field crops, fruits, small fruits, and truck crops, forests and forest products, and stored products; studies insects in relation to diseases of man and other animals, and as animal parasites; experiments with the introduction of beneficial insects, and with the fungous and other diseases of insects, and conducts experiments and tests with insecticides and insecticide machinery. It is further charged with investigations in apiculture. The information gained is disseminated in the form of bulletins and circulars. Much museum work is done in connection with the Division of Insects of the National Museum, and insects are identified for experiment stations and other public institutions and private individuals.

The work of this bureau is organized under the following sections:

INVESTIGATIONS OF INSECTS AFFECTING SOUTHERN FIELD CROPS.

W. D. HUNTER, *in Charge.*

The investigation of the Mexican cotton-boll weevil and the bollworm and other cotton pests is the principal field of work under this section. It includes also the special investigation of the life history of the cattle tick and other ticks parasitic on domestic animals, and the investigation of the insect enemies of tobacco, rice, and sugar cane, and of cacti planted for forage.

Boll-weevil investigation.—The investigation of the cotton-boll weevil covers field and laboratory investigation; the perfection of the cultural system of control; the utilization of parasites; the testing of insecticides and other remedies; and the study of changing habits with spread to new territory and under new conditions, as affecting means of control. On account of the great damage that has been done in the Mississippi Valley a special laboratory was established at Tallulah, La., on July 1, 1909. New phases of the problem, due to the peculiar climatic conditions in that important cotton-producing region, will be studied.—W. D. Pierce, principal assistant.

Cattle-tick investigation.—The work of the Bureau of Entomology on the cattle tick is limited to careful life-history studies covering the whole distribution of the tick, to form a basis for the intelligent application of the pasture-rotation method of control. The life history and habits of many other ticks affecting domestic animals, some of them of high economic importance, are being investigated as means of discovering the best system of control. A special investigation of the ticks which transmit the highly fatal human disease known as "spotted fever" in the Rocky Mountain region was undertaken. The object is to discover means of control of the ticks, by which means the disease itself may be controlled or eradicated.—F. C. Bishopp, principal assistant.

Tobacco-insect investigation.—This investigation covers primarily the insects damaging tobacco in the dark-tobacco districts of Kentucky and Tennessee, but the results gained will apply substantially to other tobacco districts. It includes field demonstration of the efficiency of methods of prevention or control.—A. C. Morgan, principal assistant.

Rice and sugar-cane insect investigation.—This new line of investigation was undertaken on July 1. The several insect pests of sugar cane and rice are

assuming new importance on account of the fact that the ravages of the boll weevil in the humid region have in many cases forced planters to substitute these crops for cotton.—D. L. Van Dine, principal assistant.

CEREAL AND FORAGE INSECT INVESTIGATIONS.

F. M. WEBSTER, *in Charge*.

These investigations comprise field studies and experimentation on insect enemies of wheat, corn, and other cereals, clover, alfalfa, timothy, and all other plants used in any way for forage. The principal grain-infesting insects under investigation are the Hessian fly, joint-worm, chinch bug, grain aphides, including the so-called "green bug," together with many others of lesser note. The principal insect enemies of forage crops at present under investigation are grasshoppers or locusts, the clover-root borer, clover and alfalfa seed Chalcids, the clover-flower midge, and the timothy Isosoma, besides a large number of insects of lesser importance. Special investigations on the Hessian fly are being carried on in connection with farmers and experiment stations, and other state institutions, in over twenty States. Of the special investigations one relates to the sorghum midge in the Southern States: another to an entirely new pest that appears to have originated in northeastern New Mexico and that has since spread to the adjacent States of Texas, Oklahoma, Kansas, and Colorado, ravaging the cattle and sheep ranges, and which has this year destroyed the forage grasses on over 25,000 acres of land in northeastern New Mexico. An outbreak of wireworms is being investigated in the State of Washington and a similar investigation is being carried on with reference to the so-called "bud-worm" of corn in the Southern States. In addition, the insect parasites of all these destructive insects are being studied, and especially in the case of one of these parasites, which has become annoying to man. The principal assistants are George I. Reeves, W. J. Phillips, Charles N. Ainslie, E. O. G. Kelly, and Jas. A. Hyslop.

INVESTIGATIONS OF INSECTS AFFECTING DECIDUOUS FRUITS.

A. L. QUAINANCE, *in Charge*.

This branch of the Bureau is charged with the investigation of insects injurious to orchards, vineyards, nut trees, etc., and certain special crops, as cranberries. Close touch is kept on orchard conditions throughout the country and on the prevalence and destructiveness of insect pests. Field laboratories are maintained for a series of years in important fruit sections, and the destructive insects of the region carefully studied. Experiments and demonstrations on a commercial scale are made in the preparation and use of insecticides, spraying apparatus, etc. Some special projects under way are:

Grape root-worm investigation.—An investigation of the grape root-worm has been under way for about two years, with headquarters at North East, Pa. The work has included an investigation of the life history of the insect and extensive experiments with control methods, including the use of sprays and cultural methods and the renovation of vineyards already badly injured.—Fred Johnson, principal assistant.

Pear thrips investigation.—A study of the very injurious pear thrips was begun in July, 1906, with headquarters at San Jose, Cal. A thorough investigation of the life history of the species is under way, and tests have been made and are in progress of many sprays and of cultural methods, including irrigation, cultivation, use of fertilizers, etc. Other California insects are being investigated at this field station, such as the California peach borer, the brown apricot scale, the grape Phylloxera, etc.—S. W. Foster and P. R. Jones, principal assistants.

Codling moth investigation.—The investigation of the codling moth or apple worm includes detailed life-history studies of the insect in different sections of the country—Washington, D. C., Pennsylvania, Arkansas, Nebraska, Michigan, and California. It is desired to determine any variations in the behavior of the species, due to climatic or other conditions, as forming a basis for a complete account of the insect for the country as a whole. Extensive experiments with

various sprays, including dusts, have been made to determine the times and number of applications which should be given to secure the best results, especially for the second brood, where this is present. A feature of the work has been the carrying out of demonstrations in spraying on a strictly commercial basis.

Cranberry insect investigation.—Owing to the increasing losses from insects to cranberry growers in Wisconsin, a special investigation of the subject was undertaken by the Bureau in 1908. Conditions of culture in that State differ to such an extent from those obtaining in other cranberry regions that methods of insect control elsewhere found effective are there inadequate. Practical remedies have been determined and their value is now being demonstrated on a commercial scale.

INVESTIGATIONS OF INSECTS AFFECTING TROPICAL FRUITS.

C. L. MARLATT, *in Charge*.

Under the above heading come all investigations of insects affecting the citrus fruits, pineapple, olive, fig, and all other tropical and subtropical fruit cultures. The investigation of the white fly in Florida, and of the black and other citrus scale insects in California and of hydrocyanic-acid gas and other means of control of these pests come in this section.

White fly investigation.—The work under way includes a detailed life-history study of the white fly and investigation of its control (1) by fumigation with hydrocyanic-acid gas or other insecticide treatments; (2) by fungous diseases, and (3) by the introduction and encouragement of natural enemies.—E. A. Back, principal assistant.

Hydrocyanic-acid gas investigation.—A detailed investigation of the subject of fumigating citrus trees has been undertaken in southern California at the instance of horticultural commissioners of the principal orange-producing counties. It will include an investigation of the proper dosage for different scale pests and of the effects of the application on the health of trees and fruitage, and is aimed thoroughly to standardize the process.—R. S. Woglum, principal assistant.

TRUCK-CROP AND STORED-PRODUCT INSECT INVESTIGATIONS.

F. H. CHITTENDEN, *in Charge*.

Truck-crop insects.—Under this head comes the investigation of insects affecting vegetables, including the sugar beet, and of such small fruits as strawberry and blackberry. Field studies are being conducted in Virginia, Florida, Texas, Colorado, and California.

At Norfolk, Va., work is being undertaken in cooperation with the Virginia Truck Experiment Station, the Bureau of Plant Industry, the Southern Produce Company, and the Virginia State Board of Agriculture. The principal insects studied are the spinach aphid or "green fly," the cabbage aphid and other cabbage pests, the striped cucumber beetle, the Colorado potato beetle, and cutworms.—F. A. Johnston, principal assistant.

Similar lines of work have been conducted in Florida, with headquarters at Orlando. The principal insects under investigation were thrips, aphides, cutworms, webworms, the cabbage looper, the red spider, the pickle and melon worms, a local army worm, leafhoppers, and numerous minor pests.

In Texas investigations are being conducted in cooperation with the Bureau of Plant Industry with headquarters at Brownsville. The insects under special observation include the onion thrips, the melon aphid, the pickle and melon worms, flea-beetles, the bollworm on tomatoes, sweet corn, and other truck crops, webworms, the sweet-potato root-borer, the pepper weevil, and certain semitropical species.—D. K. McMillan, principal assistant.

In Colorado a line of investigations has been opened up during the summer on some of the same insects which occur both in Texas and in Colorado, and special work is being conducted on the effect of arsenicals on beet-feeding species, and the determination as to whether spraying sugar beets with arsenicals could affect cattle which are turned into the field after the crop is off. This latter work is being conducted in cooperation with the Bureau of Chemistry.

Similar work is being done on the insects of the Pacific coast, chiefly in southern California, with headquarters at Compton, Cal. The principal insects include those which affect the sugar beet, comprising root aphides, leafhoppers, white grubs, wireworms, leaf-beetles, and flea-beetles. In connection with these studies insects affecting asparagus, celery, cabbage and related crop plants, onions, potatoes, and other truck crops are being studied.—H. M. Russell, principal assistant.

Stored-product insects.—Under the head of stored-product insects comes the investigation of the insect enemies of such materials as grain, flour, meal, and prepared cereals, leguminous seeds, dried fruits, nuts, drugs, tobacco, dried meats, and other animal products, such as cheese, leather, hides, wool, various fabrics, etc. As remedies for mill pests, experimental and demonstration work is being carried on with hydrocyanic-acid gas, carbon bisulphid, sulphur gases, and others. A special study is being made of export flour from the Gulf region to determine the principal sources, and means of prevention, of infestation.—C. H. Popenoe, principal assistant.

FOREST INSECT INVESTIGATIONS.

A. D. HOPKINS, *in Charge*.

The work of this branch of the Bureau covers the entire field of forest entomology. Field investigations have been extended into the forests of every State and section of the country to determine the principal insect enemies of forest trees and forest products, the character and extent of their depredations, and the more important facts relating to the life and history of the insects, the general and local conditions of forest management and lumbering methods, and other subjects upon which to base conclusions and recommendations relating to practical methods of preventing losses.—Principal assistants, H. E. Burke and J. L. Webb.

Special investigations are being made of the insects and problems found to be the more important, and the work is directed to the forests and regions where the local interest and facilities offer the best opportunity for the successful prosecution of the technical investigations and the securing of practical results.

Special efforts are being made through cooperation with private owners and the officials of national and state forests to demonstrate the practical value of the results already attained and to inaugurate proper insect-control policies.

District field agents have been located in National Forest Districts 1 and 2 to cooperate with forest officials and private owners in the more practical work of determining the character and extent of insect depredations, to assist in the location and marking of infested timber, and in giving practical advice on the essential features of the control operations as based on the expert recommendations of the Bureau.

It is planned to locate such district field agents in all of the national forest districts, as well as in the more important forest districts of other sections of the country, to render similar assistance to owners of forests and manufacturers of forest products, and in demonstrating the practical value of the determined methods of preventing losses.

In some cases the private interests detail a man familiar with the practical features to work under the instructions of the experts of the Bureau in the practical applications of the recommendations, and in this manner the technical recommendations are made to conform with the practical requirements of the business involved.

INSECTICIDE AND INSECTICIDE MACHINERY INVESTIGATIONS.

C. L. MARLATT, *in Charge*.

This section covers the field of practical experimentation with insecticides and insecticide machinery. A chemist working in cooperation with this Bureau is detailed by the Bureau of Chemistry to take charge of the analyses and tests of new insecticides. Field operations and experiments are conducted on a demonstration scale. Most of this work is now distributed under the different special investigations of the Bureau.

INVESTIGATIONS OF INSECTS AFFECTING SHADE TREES AND ORNAMENTAL PLANTS.

(Under the direction of the Entomologist.)

This constitutes a section separate from the investigations on the insect enemies of forests, and although some of the insects are identical the problem of how to deal with them is in most cases quite distinct. It includes the economic treatment of borers, tree defoliators, scales, and aphides, as well as other insects that affect trees in public parks and in the streets of large cities. A number of insects of this class, importations from Europe, such as the leopard moth, gipsy moth, brown-tail moth, and imported willow curculio, are demanding more attention year by year. This section includes also investigations of insects affecting greenhouse and garden ornamental plants and trees.

INSECTS IN RELATION TO DISEASE AND AS ANIMAL PARASITES.

(Under the immediate direction of the Entomologist.)

This field of investigation has assumed very great importance during the last few years as a result of the connection established between the mosquito and various diseases, such as malaria and yellow fever, and the agency of the house fly in the dissemination of typhoid fever. It covers not only the rôle played by insects as conveyors and disseminators of diseases among man and the lower animals, but also deals with insects as internal and external animal parasites, including such species as the biting hornfly, gadflies, buffalo gnats, ticks, etc.

INVESTIGATIONS IN BEE CULTURE.

E. F. PHILLIPS, *in Charge*.

The importance of the bee-keeping interests of the United States is recognized by the maintenance of an office for special investigations in this field. Requests from all parts of the country for information regarding various phases of apiculture are constantly being received.

The structure and development of the bee are being investigated. Various phases of the behavior of bees are being studied, since all practical manipulations depend on a thorough knowledge of habits. Several lines of practical work are being investigated, and the ultimate object of all the work of this office is to aid the bee keeper by giving reliable information which will be of use to him in his business. The present status of the bee-keeping industry is being investigated in great detail in three States.

Bee disease investigation.—G. F. White, bacteriologist. The cause, distribution, methods of spread, and treatment of the various bee diseases are being investigated thoroughly in order that some means may be found of controlling this source of heavy loss.

INTRODUCTION OF FOREIGN BENEFICIAL INSECTS.

(Under the immediate direction of the Entomologist.)

Results of extraordinary value in the control of certain imported insect pests have been secured by the introduction of their natural enemies, and two or three notable successes have resulted in the annual saving of more than the cost of the Bureau of Entomology since its origin as a Division. The introduction of enemies of the boll weevil and of the gipsy and brown-tail moths comes in this field. When such work is carried out by expert entomologists there need be no risk of introducing injurious forms, but if attempted by others there is danger of the introduction of harmful species.

GIPSY MOTH AND BROWN-TAIL MOTH INVESTIGATIONS.

(Under the immediate direction of the Entomologist.)

The work looking to the control of the gipsy moth and brown-tail moth is carried out under a special appropriation of Congress of \$300,000. The Secretary of Agriculture is authorized to expend said appropriation by establishing

a quarantine, in cooperation with the state authorities, against the further spread of these moths.

The work against the brown-tail moth is largely by distribution of information concerning remedial methods, to encourage local control.

Field work against gipsy moth.—D. M. Rogers, in charge. The prevention of the spread of the gipsy moth is accomplished chiefly by clearing out strips of forests bordering the roadways to prevent the carriage of larvæ on passing automobiles and other vehicles.

Parasite laboratory.—W. F. Fiske, principal assistant. A laboratory is maintained for the assemblage, study, proper separation, and liberation of imported parasites of the gipsy and brown-tail moths; field studies are made of the work of imported and native parasites.

MISCELLANEOUS INVESTIGATIONS.

(Under the immediate supervision of the Entomologist.)

Much work accomplished by this office does not fall under any of the headings previously noted. Such are supervision of quarantine operations, propagation and distribution of fungous diseases of insects, and the identification of material for experiment stations and individuals, not only in the United States but in various foreign countries. A great deal of technical work is also done by the employees of this office, most of whom are specialists in some particular group of insects and do more or less work in the classification and care of the museum material coming directly under their hands. No little part of the work is also represented by the correspondence, which is very voluminous. The preparation of bulletins, circulars, and general reports covering the investigations already referred to is a very important feature of the work.

BUREAU OF BIOLOGICAL SURVEY.

Chief, HENRY W. HENSHAW; *Assistant Chief*, T. S. PALMER.

The Bureau of Biological Survey studies the geographic distribution of animals and plants, and maps the natural life zones of the country; it also investigates the economic relations of birds and mammals, recommends measures for the preservation of beneficial and the destruction of injurious species, and is charged with carrying into effect the provisions of the Federal laws for the importation of wild birds and other wild animals, and for the protection of game by control of interstate trade in game, and by other means.

The Bureau is divided into three divisions, the work being distributed as follows: (1) Biological surveys and investigations of the geographic distribution of mammals and birds, in charge of Vernon Bailey; (2) investigations to determine the relation of birds and mammals to agriculture, their food habits, etc., in charge of A. K. Fisher; (3) supervision of matters relating to protection of game and the importation of foreign birds and animals, in charge of T. S. Palmer.

DIVISION OF ACCOUNTS AND DISBURSEMENTS.

Chief and Disbursing Clerk, A. ZAPPONE.

The Division of Accounts and Disbursements audits, adjusts, and pays all accounts and claims against the Department; decides questions involving the expenditure of public funds; prepares advertisements and schedules for annual supplies, exclusive of those prepared by the General Supply Committee, and letters of authority; writes, for the signature of the Secretary, all letters to the Treasury Department pertaining to fiscal matters; examines and signs requisitions for the purchase of supplies; issues bills of lading and requests for passenger and freight transportation; prepares the annual estimates of appropriations; prepares annual fiscal reports to Congress, and transacts all other business relating to the financial interests of the Department.

The Chief of the Division, as administrative officer of the fiscal affairs of the Department, has supervision over all fiscal agents, and gives the accounts submitted by them a close administrative examination.

WEATHER BUREAU SECTION.

EDGAR B. CALVERT, *Assistant Chief, in Charge.*

This section audits all accounts for the Weather Bureau and prepares checks in settlement thereof.

FOREST SERVICE SECTION.

M. E. FAGAN, *Fiscal Agent, in Charge*; E. A. MELZAR, *District Fiscal Agent, Assistant.*

This section audits accounts and prepares checks in settlement thereof pertaining to the Washington office of the Forest Service, and also keeps a record of all fiscal matters and liabilities pertaining to the field force of the Forest Service.

DISTRICT FISCAL AGENTS.

Through the following-named district fiscal agents in the field, the Division of Accounts and Disbursements audits and pays the field accounts of the Forest Service: J. A. Urbanowicz, Missoula, Mont.; H. I. Loving, Denver, Colo.; J. J. Duffy, Albuquerque, N. Mex.; Q. R. Craft, Ogden, Utah; F. C. Thompson, San Francisco, Cal.; A. H. Cousins, Portland, Oreg.; W. R. Fuchs, Madison, Wis.

CASHIER'S SECTION.

A. W. SMITH, *Cashier and Chief Clerk, in Charge.*

This section prepares and mails all checks and handles all moneys received and disbursed.

AUDITING SECTION.

EVERETT D. YERBY, *Auditor, in Charge.*

This section audits all salary, reimbursement, purchase, telegraph, and express accounts.

MISCELLANEOUS SECTION.

W. J. NEVIUS, *Auditor, in Charge.*

This section has charge of the preparation of the several annual fiscal reports to Congress and the audit and administrative examination of the accounts and disbursements of the Forest Service and of the Weather Bureau; also audits all accounts of the Board of Consulting Scientific Experts.

BOOKKEEPER'S SECTION.

F. W. LEGGE, *Bookkeeper, in Charge.*

This section keeps all books pertaining to the fiscal affairs of the Department, indexes all accounts, prepares all requisitions on the Treasury for advances of public funds, and has charge of the correspondence with the accounting officers of the Treasury in the settlement of accounts.

FREIGHT AND TRANSPORTATION SECTION.

E. E. FORBES, *Auditor, in Charge.*

This section audits all passenger and freight accounts and prepares and issues all bills of lading and passenger and freight transportation requests.

DIVISION OF PUBLICATIONS.

Editor and Chief, JOS. A. ARNOLD; *Editor and Assistant Chief*, B. D. STALLINGS; *Chief Clerk*, A. I. MUDD.

The Division of Publications is the publishing house of the Department of Agriculture under the immediate supervision of the Secretary. Its force comprises editors, proof readers, compilers, indexers, abstracters, artists, drafts-

men, engravers, and photographers, together with clerks and laborers engaged in the distribution of the publications. The Division is charged with (1) preparation and editing of the manuscripts and indexing the publications of the Department, including the Yearbook, annual reports, bulletins, etc.; (2) the preparation, printing, and distribution of Farmers' Bulletins; (3) supervision and equitable assignment of the printing fund (\$460,000); (4) the general direction of expenditures under the statutory and divisional appropriations; (5) the supervision of all printing and binding done for the Department; (6) the preparation of drawings for illustrations, of wood engravings, and photographic work; (7) the distribution of Department publications, and all correspondence in connection therewith; (8) the preparation and distribution of official information and of advance notices of publications to agricultural writers and papers. The Division of Publications is the authorized medium of all official communications between the Department of Agriculture and the Government Printing Office.

EDITORIAL WORK.

B. D. STALLINGS, *Editor and Assistant Chief, in Charge.*

The duty of seeing that the publications and the routine printing of the Department are properly put through the press falls upon the editorial force.

The work comprises the reading and editing of all manuscripts submitted for publication by the Department, preparing them for the printer, correcting the proofs, and the inspection of the completed work. The form and style of all publications, blanks, etc., is indicated by this section, which is also charged with the preparation of advance notices of bulletins and reports, or any work of the Department which may be of interest to the public. It keeps the records and looks after the numerous details of the vast volume of printing and binding for the Department. Special reports on particular subjects as well as the abstracts and synopses of bulletins and reports are intrusted to the section.

The editorial corps is as follows: Geo. Wm. Hill, R. B. Handy, Ephraim Cornman, William F. Harding, George W. Kennedy, Stanley Searles, and T. K. Burrows, assistant editors.

INDEXING.

CHARLES H. GREATHOUSE, *in Charge.*

This branch of the work is occupied with the preparation of indexes of Department publications for immediate use in the Division, and for publication and distribution, with correspondence requiring full and accurate references or involving unusual difficulty in locating the desired information, and with the revision and publication of the Division circulars and lists. The indexes of the Yearbook and many other publications which have indexes printed under the same covers with the text are also made here. Translation and compilation of information, for use in the Division and for publication, are usually assigned to the indexing section.

ILLUSTRATIONS.

L. S. WILLIAMS, *in Charge.*

In this branch of the work a corps of artists, draftsmen, wood engravers, photographers, and clerks is engaged in preparing illustrations for the publications of the Department, and in doing the photographic work required by the various Bureaus, Divisions, and Offices of the Department. It is also prepared to furnish to miscellaneous applicants photographic prints and lantern slides at the prices fixed by the Secretary under the law. Gradually the photographic work of the Department is being centralized in this section.

DISTRIBUTION OF PUBLICATIONS.

FRANCIS J. P. CLEARY, *Acting Assistant in Charge.*

Under section 92 of the act providing for the public printing and binding and the distribution of public documents, approved January 12, 1895, the duty of distributing the publications of the Department of Agriculture is assigned by

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the Secretary to the Editor and Chief of Division, who is required to keep a detailed account of all publications received from the Public Printer and distributed and to take measures to avoid duplication.

This duty is performed in the Document Section, which receives, cares for, and distributes all the publications of the Department of Agriculture. A large force of clerks and laborers is employed in directing franks under which the documents are mailed, in keeping account both of their distribution to Congressmen and to miscellaneous applicants, and in storing, folding, wrapping, and other work incidental to mailing the publications.

The applications for publications, the keeping of card indexes, the preparation of registry lists, and the care of the mailing lists of the Department necessitate the employment of a corps of clerks, stenographers, and typewriters.

YEARBOOK.

(Under the immediate supervision of the Editor and Chief.)

The preparation of the Yearbook of the Department, which occupies a considerable portion of the time of this Division, involves the selection of timely articles and the presentation of the year's progress in Agriculture. The editing of this material and putting it in form for the printer, the selection and making of illustrations, reading proof, indexing, and final supervision of publication is in progress during the greater part of each year.

FARMERS' BULLETINS.

(Under the immediate supervision of the Editor and Chief.)

The Division of Publications has general charge of the Farmers' Bulletin series of publications. These are brief popular bulletins, giving in simple, concise language the results of investigations and experiments, outlining methods of farm procedure, and offering instructions and suggestions to practical farmers and those who may desire to become such. Under the law four-fifths of all Farmers' Bulletins printed are allotted to Senators, Representatives, and Delegates in Congress for distribution to their constituents, the remainder being reserved for distribution by the Department.

BUREAU OF STATISTICS.

Statistician and Chief of Bureau, VICTOR H. OLMSTED; Assistant Statistician and Assistant Chief of Bureau, CHARLES C. CLARK; Associate Statistician, NAT. C. MURRAY; Chief Clerk, SAMUEL A. JONES.

The Bureau of Statistics issues the monthly crop reports of the Department of Agriculture, prepares the statistical portion of the Yearbook, and makes special investigations relating to agricultural statistics and agricultural economics, for publication in bulletin form or in response to special inquiries.

The monthly crop reports, in their scope, give at appropriate seasons the acreage, condition, production, quality and prices of corn, wheat, oats, barley, rye, buckwheat, flaxseed, potatoes, hay, tobacco, rice, and cotton; the relative condition during the growing season and the final production, compared with a full crop, expressed in percentages, of apples, blackberries, cantaloupes, cranberries, grapes, lemons, oranges, peaches, pears, raspberries, strawberries, watermelons, asparagus, beans, cabbage, onions, sweet potatoes, tomatoes, broom corn, hemp, hops, peanuts, sorghum, sugar beets, sugar cane, alfalfa, blue grass, Canadian peas, cowpeas, clover, kafir corn, millet, timothy, and pastures; yield per acre of hops, sweet potatoes, sugar beets, and sorghum; they give the stock of wheat, corn, and oats on hand at stated periods, the number, value, condition, losses by disease or exposure of live stock, and the average weight per fleece of wool.

The statistics of acreage and production issued by this Bureau are based upon estimates, and not upon an enumeration, the main object being to present early in the crop season approximately accurate statements of supplies before the products have been entirely distributed or consumed.

The Bureau compiles and tabulates, from official and commercial sources, the world's production, by countries, of corn, wheat, oats, barley, rye, potatoes,

rice, sugar, cotton, flax, tobacco, wool, hops, and live stock, and records and tabulates prices of the principal agricultural products in various markets of the United States.

It also tabulates and coordinates statistics of agricultural production, distribution, and consumption, the authorized data of governments, institutes, societies, boards of trade, chambers of commerce, produce exchanges, trade journals, and individual experts.

Concise summaries of the monthly crop reports are given to the press and telegraph companies at a specified hour, previously advertised, and thus distributed quickly throughout the country. Printed cards with these summaries are mailed to post-offices for display, and details are printed soon after in the "Crop Reporter," designed for circulation among producers and consumers.

CROP REPORTING BOARD.

VICTOR H. OLMSTED, *Chairman*.

Monthly crop estimates for important crops are made by a Crop Reporting Board, consisting of the Chief of Bureau as chairman, and four individual members, selected from the officials of the Bureau at Washington and from the Special Field Service and State Statistical Agents, called to Washington on report days for that purpose. Part of the personnel of the Board is changed from month to month. Thus the members of the Board are selected from a corps of over 50 men, well trained and thoroughly informed as to crop conditions, and as to the relative value and correctness of the various data upon which the crop reports are based. The data upon which the monthly crop reports are based are collected in quadruplicate, that is, from four sources, independent of each other, and used as a check against each other. In a few inquiries, additional sources of information are utilized. Thus reports relating to acreage and production of cotton are based upon returns from (1) Field Agents; (2) State Statistical Agents; (3) County Correspondents; (4) Township Correspondents; (5) Ginners; (6) Special list, made up mostly of bankers, supply men, etc.; (7) Individual farmers reporting for their own farms.

The members of the Board, during the calendar year 1909, in addition to the chairman each month, were as follows: From the Department at Washington, C. C. Clark, Nat C. Murray, George K. Holmes, and Charles M. Daugherty; from the Special Field Service, J. J. Darg, J. P. Killebrew, T. C. Shaw, W. L. Pryor, H. H. Johnson, F. W. Gist, H. T. Bradford, F. S. Pinney, J. W. Richardson, and F. N. Gray; and from State Statistical Agents, W. A. Withers, W. J. Northern, Jefferson Johnson, W. C. Duncan, John Cownie, P. A. Rogers, T. J. Anderson, L. T. Moulton, C. L. Hare, E. J. Lundy, A. G. McCall, C. H. Morse, and J. H. Shepperd.

DIVISION OF DOMESTIC CROP REPORTS.

FRED J. BLAIR, *Chief*.

The Division of Domestic Crop Reports handles the reports of various classes of crop correspondents of the Bureau of Statistics throughout the United States. Blank schedules are sent each month to correspondents, to be used by them in making their reports regarding crop areas and conditions, quantities and qualities of production, live stock, etc., as indicated in the preceding description of the work of the Bureau of Statistics. These reports, when received, are tabulated for the use of the Statistician and the Crop Reporting Board in compiling monthly estimates as published by the Department of Agriculture in the Crop Reporter. At intervals blank schedules are sent to cotton ginners, individual farmers, and special correspondents, to be used by them in making reports regarding cotton, live stock, and the areas and quantities of various crops, which are tabulated for use in the same manner as the reports referred to.

An important branch of the work of this Division consists in keeping filled the ranks of the Bureau's crop correspondents, among whom numerous changes, both in personnel and post-office addresses, occur from month to month.

The voluntary correspondents make reports on acreage, condition, and yield of various crops, and on the numbers and values of live stock, from time to time.

The Chief of this Division has charge of the making of such statistical computations and compilations as are required for the use of the Bureau of Sta-

tistics and for other Bureaus of the Department of Agriculture which have need of such work.

The mailing lists of the Bureau are under the direction of the Chief of this Division, who also has charge of receiving, assorting, and distributing the voluminous daily mail of the Bureau.

FIELD SERVICE.

The service outside of Washington consists of the Special Field Service; 44 State Statistical Agents; 4 Special Agents at the Minnesota Experiment Station; and about 125,000 voluntary correspondents.

SPECIAL FIELD SERVICE.

(Under immediate direction of Chief of Bureau.)

Special Field Agents, H. T. Bradford, J. J. Darg, S. D. Fessenden, F. W. Gist, F. N. Gray, A. F. Hitt, H. H. Johnson, Paul H. Kirk, F. S. Pinney, W. L. Pryor, H. M. Rhoads, J. W. Richardson, J. E. Richards, T. C. Shaw, and B. C. White; Special Agent on Rice, De Lancey Evans; Special Agent on Tobacco, J. P. Killebrew.

Each Special Field Agent systematically traverses the agricultural sections of the United States within a certain designated district or group of States, carefully notes the development of each important crop, keeps in close touch with the best informed opinion throughout his district, and reports to the Statistician. The Special Agent on Rice and the Special Agent on Tobacco traverse all portions of the United States in which the respective agricultural products upon which they report are produced.

The State Statistical Agents maintain special corps of correspondents and report to the Statistician upon agricultural conditions for the States they represent. The majority are authorized to travel over their respective States at least twice each year, thus keeping in close touch with their correspondents and with agricultural conditions.

DIVISION OF PRODUCTION AND DISTRIBUTION.

GEORGE K. HOLMES, *Statistical Scientist in Charge.*

The Division of Production and Distribution has developed a scope of work in directions heretofore little, if at all, explored. It has created a general survey of agricultural conditions and accomplishments in the United States, composed of the more important elements of production, in quantity and value; of national surplus, deficiency, and consumption; of farm wealth and labor; and of economic achievement and agricultural progress.

The production of important agricultural commodities by the principal countries of the world below and above their respective requirements for consumption, the sources of the supply of such commodities to deficient countries, and the destination of the surpluses of exporting countries together constitute a subject of unceasing popular interest which is receiving much attention in this Division.

The historical aspect of the agricultural production of the United States in particular products and of the surplus or deficiency with regard to domestic consumption has occasioned much painstaking and original work.

The trend of events in recent years has made the future supply of wheat a world problem, and the subject has received and is receiving original treatment. Meat supply also is a problem of world-wide concern, and a large amount of varied information concerning it has been collected and published. Constant efforts are made to bring to date the information concerning wheat and meat.

The transportation of agricultural products from farm to consumer by wagon, rail, and water is one of the special subjects which have been productive of much original work in this Division. It is accumulating much information relating to farmers' associations on the cooperative plan for production, selling, and buying; for fire, live-stock, and other insurance; for warehousing, for performing telephone service, and for promoting mutual helpfulness. Matters of economic significance in the production of wealth on farms and in the disposal of products afford a wide range for work in this Division in many directions which are not pursued by any other departmental office.

Along the lines of work pursued, the effort is to establish permanent results of frequent utility to the offices of the Department of Agriculture, to the many applicants for information outside of the Department, and to the general public. Most of the many bulletins issued from this Division are of permanent usefulness and are in current demand; the many special articles that have been prepared for the Yearbook by persons employed in this Division are of continuing service; and the three score statistical tables contributed to the Agricultural Statistics of the Yearbook are brought down to date annually and are of permanent value.

This is an office of special research and investigation within a field not covered by any office in any other Department. The following lines of work illustrate the activities of this Division: The total quantity and value of agricultural production yearly subsequent to the Federal census; an annual review of agricultural production; the ascertainment of the National surplus of agricultural products in quantity and value; a summary of the receipts in the United States of the agricultural products of other countries and a determination of the farmers' international balance of trade. There are such inquiries also as those relating to the movement from city to country, rural life and agriculture, the wages of farm laborers in the United States, and the chronology of United States agriculture.

In continuation of the foregoing may be mentioned a compilation of the international trade of all countries in prominent agricultural products; the production of prominent crops in all chief countries of the earth; the dates of planting and maturity of cultivated crops in all countries, including the United States; and cotton production throughout the world with reference to the maintenance of the supremacy of the cotton of the United States.

EDITORIAL DIVISION AND LIBRARY.

CHARLES M. DAUGHERTY, *Chief*.

The work of this Division is chiefly editorial in character and may be summarized as follows:

Editing and revising all bulletins and circulars written or compiled in the Bureau.

The preparation of articles for and the editing of the *Crop Reporter*, a monthly publication of the Bureau, designed to disseminate useful and timely information in regard to crops, agricultural conditions, and prices of agricultural products in the United States and foreign countries.

The preparation of bulletins.

The examination and collation of information from domestic and foreign journals, Federal, State, and foreign censuses, reports of municipal chambers of commerce, and of statistical bureaus of home and foreign governments on matters relating to agriculture, for the purpose of preparing reports thereon and of answering special inquiries addressed to the Department concerning agricultural statistics.

Translations for the Bureau, and occasionally for other Bureaus of the Department, of articles and letters in foreign languages.

The compilation of statistics from official and other sources, giving, in so far as ascertainable, the world's annual area and production, by countries, of corn, wheat, rye, oats, barley, and flaxseed, and the production of coffee, for publication in the Yearbook.

The management and care of the statistical library of the Bureau, and, in connection therewith, the compilation of a comprehensive card index of current agricultural information contained in the official and commercial publications of the principal countries of the world.

LIBRARY.

Librarian, CLARIBEL R. BARNETT; *Assistant Librarian*, EMMA B. HAWKS.

The Librarian has general supervision of the library, purchases books and periodicals, supervises their arrangement and cataloguing, and has charge of the preparation of bibliographies and similar publications. The Librarian is also in charge of the mailing lists for the distribution of Department publications in foreign countries.

OFFICE OF EXPERIMENT STATIONS.

Director, A. C. TRUE; Assistant Director, E. W. ALLEN; Chief Clerk, Mrs. C. E. JOHNSTON.

The work of the Office of Experiment Stations includes: (1) Relations with American and foreign institutions for agricultural research, together with the supervision of expenditures of the agricultural experiment stations in the United States; (2) the preparation of publications; (3) the management of the experiment stations in Alaska, Hawaii, Porto Rico, and Guam; (4) relations with agricultural colleges and schools, farmers' institutes and kindred organizations at home and abroad, and the general promotion of agricultural education in the United States; (5) irrigation investigations; (6) drainage investigations; and (7) nutrition investigations. In all lines of work the Office cooperates with the agricultural colleges and experiment stations.

RELATIONS WITH INSTITUTIONS FOR AGRICULTURAL RESEARCH.

E. W. ALLEN, Assistant Director, and Editor of Experiment Station Record.

This Office represents the Department in its relations with the agricultural experiment stations maintained in all the States and Territories under the acts of Congress of March 2, 1887, and March 16, 1906. It supervises the expenditures of the Federal funds granted to the stations under these acts, and publishes information regarding their organization, equipment, resources, and work. Its principal publications based on the work of the stations are in two series. (1) Experiment Station Record, and (2) Experiment Station Work.

Experiment Station Record, begun in 1889, comprises abstracts of the bulletins and annual reports of the experiment stations in the United States, the publications of the United States Department of Agriculture, books, journals, and miscellaneous publications containing reports of investigations in agricultural science in the different countries of the world; editorials on important matters relating to the progress of agricultural investigation and science, station administration, suggestions of lines of inquiry for stations, agricultural education, etc.; and notes on the organization, equipment, and development of institutions for agricultural education and research at home and abroad. Each volume of the Record consists of eight numbers, and detailed author and subject indexes. Two volumes are issued annually. This journal is sent without charge to institutions for agricultural education and research in this country, to the officers of such institutions, to similar institutions in foreign countries, to important libraries, and to a select list of scientists and specialists who cooperate with the Department. It is also sold by the Superintendent of Documents at \$1 a volume.

Experiment Station Work, which is published periodically (every two months) in the Farmers' Bulletin series of the Department, gives a popular summary of some of the more salient practical results of the work of the experiment stations, and is distributed free of charge.

The editorial staff engaged in the preparation of these periodicals is as follows: Assistant editor, H. L. Knight; Agricultural Chemistry and Agrotechny, L. W. Fetzner; Meteorology, Soils, and Fertilizers, W. H. Beal; Agricultural Botany, Bacteriology and Vegetable Pathology, W. H. Evans and W. H. Long; Field Crops, J. I. Schulte and J. O. Rankin; Horticulture and Forestry, E. J. Glasson; Human Nutrition, C. F. Langworthy; Zootechny, Dairying, and Dairy Farming, E. W. Morse; Economic Zoology, Entomology, and Veterinary Medicine, W. A. Hooker; Rural Engineering, ————; Rural Economics, J. B. Morman; Agricultural Education, D. J. Crosby.

EDITORIAL DIVISION.

W. H. BEAL, Chief.

This division is charged with the editing of the publications of the Office, exclusive of the Experiment Station Record. These include: (1) Annual reports, including the administrative report of the Director and the larger annual report of the Office; (2) Experiment Station Work; (3) publications relating to the food and nutrition of man, consisting of technical and popular bulletins,

reports, and circulars, based upon the results of nutrition investigations conducted under the auspices of the Office; (4) publications relating to irrigation and drainage, which include reports, technical and popular bulletins, and circulars, giving the results of the irrigation and drainage investigations of the Office; (5) educational and other publications, including those relating to agricultural education in general, the work of farmers' institutes, proceedings of the Association of American Agricultural Colleges and Experiment Stations, and of the Association of Farmers' Institute Workers, and similar publications, and the card index of experiment station literature, besides miscellaneous documents of various kinds.

In the preparation and editing of these publications the Chief of the Editorial Division is assisted by other members of the office staff.

DIVISION OF INSULAR EXPERIMENT STATIONS.

WALTER H. EVANS, *Chief*.

This division is charged with the general business connected with the management of experiment stations in Alaska, Hawaii, Porto Rico, and Guam, which are conducted under the direction of the Office.

ALASKA AGRICULTURAL EXPERIMENT STATIONS.

C. C. GEORGESON, *Sitka, Special Agent in Charge*.

The main station for agricultural investigations in Alaska is located at Sitka. Investigations are also carried on at Rampart, in the Yukon Valley; at Kodiak; and at Fairbanks, in the valley of the Tanana River. The work consists of field experiments with vegetables, cereals, and forage plants, horticultural investigations, the maintenance of live stock, the curing of hay and silage, the distribution of seeds, and an agricultural survey of the Territory. Besides the special agent in charge, the officers of the stations are as follows: A. J. Wilkus, Assistant at Sitka; G. W. Gasser, Assistant, at Rampart; M. D. Snodgrass, Assistant, at Kodiak; J. W. Neal, Assistant, at Fairbanks.

HAWAII AGRICULTURAL EXPERIMENT STATION.

E. V. WILCOX, *Honolulu, Special Agent in Charge*.

The Hawaii Agricultural Experiment Station has headquarters at Honolulu, where a tract of land has been reserved for its use by the Hawaiian government. The investigations include experiments with cotton, tobacco, rice, forage crops, fiber and horticultural plants, and investigations in vegetable pathology and in entomology. Besides the special agent in charge, the officers of the station are as follows: D. T. Fullaway, Entomologist; J. E. Higgins, Horticulturist; C. J. Hunn, Assistant in Horticulture; F. G. Krauss, Agronomist; V. Holt, Assistant in Agronomy; W. P. Kelley, Chemist; Alice R. Thompson, Assistant Chemist; Q. Q. Bradford, Assistant in Rubber Investigations.

PORTO RICO AGRICULTURAL EXPERIMENT STATION.

D. W. MAY, *Mayaguez, Special Agent in Charge*.

The Porto Rico Agricultural Experiment Station has its headquarters at Mayaguez, on a tract of land of 235 acres, purchased for its use by the insular government. Investigations are in progress on questions relating especially to the growing of coffee, field crops, and horticultural plants, the development of the animal industry and dairying, soils, vegetable pathology, and entomology. The officers of the station are: The special agent in charge; J. W. Van Leenhoff, Coffee Expert; C. F. Kinman, Horticulturist; T. B. McClelland, Assistant in Horticulture; W. V. Tower, Entomologist; G. L. Fawcett, Plant Pathologist; P. L. Gile, Chemist; W. C. Taylor, Assistant Chemist; and E. G. Ritzman, Assistant Animal Husbandman.

GUAM AGRICULTURAL EXPERIMENT STATION.

J. B. THOMPSON, *Guam, Special Agent in Charge*; H. L. V. COSTENOBLE, *Assistant*.

The agricultural experiment station in Guam is located near Agaña, the principal town of the island. Experiments will be conducted in improved methods of cultivation, introduction, and improvement of tropical agricultural crops; introduction of improved live stock, and similar lines of work.

RELATIONS WITH AGRICULTURAL COLLEGES AND SCHOOLS.

D. J. CROSBY, *Specialist in Agricultural Education*; F. W. HOWE, *Assistant*.

This branch of the Office represents the Department in its relations with the agricultural colleges established under the acts of Congress of July 2, 1862, and August 30, 1890. It collates and publishes information regarding the organization, equipment, resources, and courses of study of agricultural colleges and schools in this and other countries. It promotes the general interests of agricultural education throughout the United States, including especially the introduction of instruction in agriculture into secondary and elementary schools.

RELATIONS WITH FARMERS' INSTITUTES.

JOHN HAMILTON, *Farmers' Institute Specialist*; J. M. STEDMAN, *Assistant*.

This branch of the Office investigates and reports upon the organization and progress of farmers' institutes in the several States and Territories, and aids in making such organizations more effective for the dissemination of the results of the work of the Department of Agriculture and the agricultural experiment station, and of improved methods of agricultural practice. It also aids in the wider diffusion of agricultural education among adults through movable schools and other forms of extension work.

NUTRITION INVESTIGATIONS.

C. F. LANGWORTHY, *Expert in Charge*; R. D. MILNER, *Assistant*.

This branch of the Office investigates and reports upon the nutritive value of agricultural products used for human food, with special suggestions of plans and methods for the more effective utilization of such products for this purpose. The work is done in cooperation with other bureaus of the Department. S. C. Clark and W. P. Garrety, Assistants in nutrition laboratory.

IRRIGATION INVESTIGATIONS.

SAMUEL FORTIER, *Chief*.

The Irrigation Investigations branch of the Office aims to extend the area irrigated and the yield and value of the crops grown on this area by improving irrigation practice, and to prevent waste of time and money by settlers by giving them practical directions as to methods of preparing land for irrigation and applying water. It includes (1) investigations and experiments for the advancement of knowledge regarding the use of water for irrigation; (2) the collection and publication of practical information regarding irrigation practice; (3) development of methods for utilizing ground and storm waters in irrigation, and the extension of irrigation in the semiarid region through the use of limited water supplies; (4) experiments in the use of power for securing a water supply for irrigation; and (5) studies of the legal and economic relations of irrigators to each other and to the public.

R. P. Teele, Assistant Chief. In charge of field work: Frank Adams, California; A. P. Stover, Oregon; C. E. Tait, Imperial Valley and Arizona; S. O. Jayne, Washington; W. W. McLaughlin, Utah; P. E. Fuller, power investigations; W. L. Rockwell, Texas; Don H. Bark, Idaho; J. W. Longstreth, Kansas; and Milo B. Williams, humid section. Assistant engineers: V. M. Cone and C. G.

Haskell. Editorial assistant: Frank Huntington. Scientific assistants: F. G. Harden and R. D. Robertson. Collaborators: O. V. P. Stout, Nebraska; Gordon H. True, Nevada; W. B. Gregory, Louisiana and Texas; F. L. Bixby, New Mexico. Irrigation farmers: John Gordon, R. G. Hemphill, W. H. Lauck, R. E. Mahoney, and John Krall, jr.

DRAINAGE INVESTIGATIONS.

C. G. ELLIOTT, *Chief.*

The Drainage Investigations of the Office embrace the investigation of the following subjects: (1) The best practical methods of removing surplus water from lands having an agricultural value in both humid and irrigated sections; (2) the protection of lands which are capable of being made productive, from the periodical overflow of streams; (3) the reclamation of tidal lands which may be made valuable for agriculture; and (4) the controlling and conservation of the rainfall on hillside lands which are susceptible of tillage.

In order to cover adequately this general field, the work is carried on by three different methods:

First. The examination and study of the drainage laws in force, and their application in this and other countries, and of past and current drainage practice, with reference to the use of various methods and their success or failure in solving existing problems in localities where drainage is an important factor in agriculture: also the collection and systematic arrangement of known general principles and descriptions of the best current drainage practice for the information and use of agricultural engineers and others upon whom the planning and carrying out of drainage work devolves.

Second. Assisting farmers, communities, and districts in the initiation and direction of drainage improvements, by extended examinations and preliminary surveys, if necessary, in order to determine the practicability of the desired drainage and the best plan to be adopted for the work, such assistance being rendered in representative localities for the purpose of encouraging and promoting correct practice rather than for the purpose of lessening the preliminary expense of those who incidentally profit by such assistance.

Third. The examination and experimental investigation of problems pertaining to land drainage, concerning which there is a lack of existing information.

Chief Drainage Engineer, C. G. Elliott; Office Engineer, A. D. Morehouse; Assistant Office Engineers, R. D. Marsden, and N. B. Wade; Draftsmen, G. F. Pohlers, and H. B. Artley; Drainage Engineers, W. J. McEathron, L. L. Hidingier, S. H. McCrory, H. A. Kipp, F. F. Shafer, and O. G. Baxter; Drainage Engineers for Irrigated Lands, D. G. Miller, R. A. Hart, S. W. Cooper, J. C. Carpenter, and W. A. Kelly; Assistant Drainage Engineers, W. W. Weir, G. M. Warren, D. L. Yarnell, J. V. Phillips, L. A. Jones, F. G. Eason, C. W. Okey, J. R. Haswell, W. J. Schlick, C. W. Mengel, and A. G. Hall; Engineers available for special work, A. E. Morgan, C. F. Brown, S. M. Woodward, and J. T. Stewart.

OFFICE OF PUBLIC ROADS.

Director, LOGAN WALLER PAGE; *Assistant Director and Chief Chemist*, ALLERTON S. CUSHMAN; *Chief Engineer*, VERNON M. PEIRCE; *Chief of Road Management*, J. EDMUND PENNYBACKER, JR.; *Chief Clerk*, W. CARL WYATT.

The Office of Public Roads collects data concerning systems of road management and all phases of road improvement, and makes comparative studies of the subject; investigates methods of road building and maintenance, and furnishes expert assistance to rural sections in road construction; tests road materials and ascertains their location and comparative value; cooperates with schools and colleges in highway engineering instruction, and publishes information of value concerning road improvement for free distribution.

The work of the Office is mainly directed: (1) To the collection and compilation of data in reference to systems of road management and to a comparative study of such systems in order to determine the merits and defects of each as far as possible and to ascertain the causes of success or failure; (2) to obtain full and accurate statistics on all phases of road improvement and present

them to the public in such forms as to constitute a practical basis for the determination of many points bearing upon the economics of road construction; (3) to direct the efforts of rural sections along proper lines in actual road building; and to this end highway engineers and road experts are detailed to render advice and cooperate with the local officials in the construction of short sections of model roads, which frequently form nuclei of extensive systems of improved roads; (4) to ascertain the location, availability, and comparative value of road-building materials in all parts of the United States, for which purpose laboratories are maintained in Washington to investigate the chemical and physical properties of road materials and other materials of construction, and to conduct experiments tending to increase facilities for road improvement so far as materials are concerned; (5) to find practical solutions for the problems confronting large sections of country where, from lack of natural road materials or from other causes, the cost of hard roads is now prohibitive. Experimental roads are built to test substitutes for natural road materials, and the question of long-distance transportation receives careful consideration; (6) to direct more general attention to highway engineering in schools and colleges throughout the United States, in order that an adequate number of competent highway engineers may be prepared to carry on properly the vast work of highway improvement. The Office is endeavoring to keep in close touch with educational institutions in this respect and to render every assistance possible. In furtherance of this general plan a one-year post-graduate course in highway engineering is conducted by the Office, providing practical laboratory and field instruction and exercises. The advantages of this system are mutual—the student renders service to the Government and in turn receives a small money compensation and such training as will fit him to discharge intelligently the duties of his profession; (7) to investigate the comparative effects of motor and horse traffic on various types of roads and to devise methods of construction adapted to modern traffic conditions; (8) to cooperate with agricultural colleges and experiment stations wherever practicable in order to accomplish the purposes above outlined. In all States having State highway officials the Office acts in harmony with such officials; (9) to disseminate by all available means information of value to the American people in connection with the improvement of roads.

ADVISORY BOARDS.

REFeree BOARD OF CONSULTING SCIENTIFIC EXPERTS.

The Referee Board was created by a special order dated February 24, 1908, and consists of the following members: Dr. Ira Remsen, chairman; Dr. Russell H. Chittenden, Dr. John H. Long, Dr. Alonzo E. Taylor, and Dr. C. A. Herter. The Board considers those scientific questions arising from time to time in the enforcement of the Food and Drugs Act of June 30, 1906, which may be referred to the Board by the Secretary of Agriculture. The Board has made an exhaustive report to the Secretary on the healthfulness of benzoate of soda in food, and is at present considering the healthfulness of saccharine and sulphur in food products.

BOARD OF FOOD AND DRUG INSPECTION.

The Board of Food and Drug Inspection created by order of the Secretary on April 25, 1907, considers all questions other than legal questions arising in the enforcement of the Food and Drugs Act of June 30, 1906, upon which the decision of the Secretary of Agriculture is necessary, and reports its findings to the Secretary for his consideration and decision. All correspondence involving interpretations of the law and questions arising under the law, not theretofore passed upon by the Secretary of Agriculture, is considered by the Board, which holds frequent meetings, at stated times, in order that findings may be reported promptly. The Board also conducts hearings based upon alleged violations of the Food and Drugs Act provided for by the rules and regulations approved October 17, 1906. The members are Dr. Harvey W. Wiley, Chief, Bureau of Chemistry, chairman; Dr. Frederick L. Dunlap, Associate Chemist, Bureau of Chemistry; and Mr. George P. McCabe, Solicitor of the Department.

COMMITTEE ON BUILDINGS OF THE DEPARTMENT OF AGRICULTURE.

A committee of which Dr. B. T. Galloway, Chief of the Bureau of Plant Industry, is chairman, is charged with the directing and supervising of changes in the buildings of the Department as may be necessary, and for advising and recommending proper and systematic management of new buildings, rented quarters, etc. This committee acts, also, as a Board of Awards, considering all bids pertaining to the construction of new buildings that may be erected by the Department of Agriculture, and all changes necessary in buildings connected with the Bureaus and Divisions of the Department. In addition to the chairman the members of the committee are Col. S. R. Burch, Chief Clerk of the Department, and Mr. A. Zappone, Chief of the Division of Accounts and Disbursements.

COMMITTEE ON PERSONNEL.

The Committee on Personnel is composed of Willet M. Hays, Assistant Secretary of Agriculture; S. R. Burch, Chief Clerk of the Department; and George P. McCabe, Solicitor of the Department.

Each Chief of Bureau, Office, or Division is directed to report to the Secretary, for reference to this committee, dereliction of duty and actions prejudicial to the interests of the Department. The committee considers all such cases, and when it finds it to be necessary, on its own motion, investigates and makes reports to the Secretary.

The committee is empowered to summon any employee as a witness. It is not intended, however, that the work of this committee shall interfere with the proper supervision of employees by other Bureau and Division officials.

ADVISORY COMMITTEE ON PRINTING AND PUBLICATION WORK.

The Advisory Committee on Printing and Publication Work is made up as follows: W. M. Hays, Assistant Secretary, chairman; Willis L. Moore, Chief of the Weather Bureau; and Jos. A. Arnold, Department Editor, secretary. The duties of the committee are to assist in carrying out the directions of the order under which it was appointed. There are no stated times for holding meetings, the committee being called together whenever its advice is deemed necessary.

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